CREATING SUCCESSFUL BULLETIN BOARD SYSTEMS

Alan D. Bryant

Includes eSoft Inc.'s TBBS fully functional bulletin board software worth $295

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Alan D. Bryant

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To my grandparents,
Ada and Cleo Bryant,
for all the love, support,
and encouragement
they've given me
throughout my life.

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I'd also like to express my thanks to Dave Remke who, when I was a bank teller, believed in my ability and taught me about PCs, DOS, dBASE, and modem communications, which in turn started me down a career- and life-changing path of untold enjoyment, fulfillment, and success.

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Phil Becker, my boss and mentor, provided me with a career opportunity when nobody else would, which has brought (and continues to bring) great personal enrichment and the most fun a person can have and still earn a paycheck. His knowledge and experience was instrumental to this project on many levels.

Jack Rickard, editor of *Boardwatch Magazine*, was the first person to entertain the idea of actually publishing my writing when his magazine (and my writing) was still quite in its infancy. Jack, personally and through his magazine, has provided untold assistance with the material for this book and deserves a great deal of credit for helping over the years to create a market for it.

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I hope the information in this book is as fulfilling for you as it was for me putting it all together. I wish you the best of success. Now, let's get started *Creating Successful Bulletin Board Systems*!

Alan D. Bryant
Denver, Colorado

Introduction

You've purchased this book because you'd like to start an electronic bulletin board system—a BBS. You realize there is a lot you need to know, even if you've been calling BBSs for years. This book is designed to introduce you to an exciting electronic world, a world where you can meet people, have fun, get work done more effectively, make a profit for you or your business, express yourself, serve your customers better, and much more, all from the comfort of your den or office.

BBSs offer a variety of features, primarily electronic messaging, file transfer, information gathering, information display and teleconferencing. In addition, features such as electronic mail networking, online entertainment, document search and retrieval, and fax on demand are often available. By operating a BBS, you're providing a service to anyone who is equipped with a computer, a modem, and a telephone line.

With a current growth rate of about 10 to 20 percent annually (and with the growth rate increasing each year), BBSs are one of the fastest-growing segments of the computer industry. It is estimated that more than 15 million people call BBSs each day in the United States alone. Operating a BBS allows you to tap directly into this huge audience of computer-smart, modem-using individuals. By starting and operating a BBS, you'll be joining over 150,000 others who are already online with their systems.

It's important to learn what makes a good BBS so you won't get lost in the online crowd. You need to know how to make the right decisions, how to differentiate your BBS from the others—in short, how to create an effective and successful bulletin board system.

A BBS Is More Than a Machine

A BBS is much more than the equipment behind it and the services it provides; a BBS is also a place. Maybe it's not a place you can touch, see, or smell, but it's a place nonetheless. One of the keys to success with a bulletin board system is to understand that by operating a BBS, you're offering your callers a place to be, a place they want to visit. By becoming a BBS *sysop* (system operator), you're a host for a group of guests who'll be using your system once it's online.

Depending on the reasons you want to start a BBS, you'll play host to your callers for one of three reasons:

- **As a hobby** You want to explore one of the most interesting aspects of computing technology for your personal enjoyment.
- **As a business** You want to become an "infopreneur"—to sell the services of a bulletin board system to a rapidly growing audience of modem-savvy computer users.
- **For a business** You or your superiors have decided that a BBS would help your company and augment the services it provides to its customers.

What This Book Offers You

This book covers all aspects of creating and operating an effective BBS: understanding bulletin boards, what they can do, what they can't do; grasping the demands of a BBS; understanding why you want to create one; planning your needs; analyzing software and hardware choices; how to market your BBS and attract users; how to keep users; how to be a good host for this place your callers will visit; and even the basics of operating a business.

By reading this book and doing all your homework, you'll have a thorough understanding of virtually every aspect of bulletin board systems. All that will remain will be to select and actually

learn the BBS software you choose for your system (and this book will help you make that selection). And after your BBS is online, you'll find *Creating Successful Bulletin Board Systems* makes a great reference guide to help keep you focused and on target with your needs and goals.

I created this book to help the hundreds of people I've talked to over the years who have been desperately trying to find this information. I knew that if I was talking to hundreds of people who were trying to figure it all out, thousands of others I hadn't talked to were struggling just as hard to learn what they needed to know to create and operate a successful bulletin board system.

One advantage of this book versus other sources of material available is that it does not make any assumptions about *why* you want to set up a BBS. I outlined previously the three common reasons why, and this book speaks to all three: to make money, to save your company money, to have fun with the technology. This book is designed to help you no matter what has brought you here.

The book is an outgrowth of my years of experience with bulletin boards. In my work as a free-lance writer for *Boardwatch Magazine*, my active role in the BinkleyTerm project for the FidoNet network, as director of marketing for eSoft (creators of The Bread Board System BBS software), and as owner of Bryant Software, I've spoken to hundreds of bulletin board operators. I've asked about their successes and their failures—and, most important, what elements brought about their success or failure. What I've found through this experience and through my own research is that there are common elements for the successful creation and operation of a BBS. What's worked for others can work for you—if you only know what's worked for others! That's the focus of this book.

What This Book Contains

This book is arranged in ten chapters. Most readers will want to approach them in order.

- **Chapter 1, "Deciding Whether to Start a BBS,"** will help you understand what a BBS is and whether it is appropriate for your situation. It also covers BBS alternatives you should be aware of.
- **Chapter 2, "Planning Your BBS,"** helps you understand how a BBS affects your life. You'll develop a theme for your BBS and begin to assess the costs involved with creating and running it.
- **Chapter 3, "Choosing Basic Hardware and Software,"** is designed to acquaint you with the many choices you face when starting a BBS, from issues such as operating system and computer platform to user interface choices.
- **Chapter 4, "Enhancing Your BBS Setup,"** introduces and explains the many BBS additions and enhancements you can select to extend basic BBS capabilities.
- **Chapter 5, "Buying Your BBS Equipment,"** aids you in the selection of hardware for your BBS. Computers, hard disk requirements, serial port hardware, and modems are all covered in detail, along with issues surrounding the purchase of your BBS software.
- **Chapter 6, "Connection Options for Your BBS,"** explains all of the various connectivity choices available to you for your BBS. From conventional telephone lines to packet switched networks, all of your choices are outlined along with their advantages and disadvantages.
- **Chapter 7, "Installing Your BBS,"** helps guide you through the many steps involved in putting together a BBS. The various steps are all thoroughly covered, from physical installation all the way through opening day for your new BBS.
- **Chapter 8, "Operating Your BBS,"** helps you understand the day-to-day issues you'll confront as the operator of a BBS, including understanding users and why they call, how to charge for access to your system, and the pitfalls of BBS operation.
- **Chapter 9, "Finding Users for Your BBS,"** covers the promotion and marketing of your BBS. Topics include how to get publicity, how to advertise, and numerous ideas for marketing your system to the public.

- **Chapter 10, "The Business of Running Your BBS,"** is designed for those who want to run a BBS as a business. It contains introductory information on forming and structuring a company, planning your business, along with such topics as legal matters.
- **Appendix, "Supplies and Services,"** is a complete resource listing and guide to companies serving the BBS community, including BBS software vendors, network providers, and more.

Insider Tips

Throughout this book, I've included Insider Tips. These special sections point out various important aspects of starting and running a BBS normally available only through time and experience. They're designed to enhance your understanding and to keep you from making the same mistakes others have made many times.

Worksheets

These worksheets are designed to help you get in touch with your needs and goals—to step you through the various aspects of researching, planning, setting up, and operating your new BBS. As you progress through the book, make sure you complete each worksheet before proceeding to the next chapter. By completing each worksheet as you progress with the creation of your bulletin board, you will ensure the most successful outcome.

Using This Book

- **If you are new to BBSs** This book is designed to be read sequentially, beginning at Chapter 1. Each chapter ends with a summary and worksheet. As you think about your BBS and make decisions, fill in each worksheet. As you move from chapter to chapter and get a clearer picture of your new system, review the chapter summaries and worksheets of

previous chapters so you can apply your evolving knowledge and understanding to earlier subjects.

- **If you are a seasoned BBS operator** You may find the initial chapters of the book helpful in gaining perspective about your system. In my experience, BBS sysops often fail to plan their systems in any meaningful way. If you are such a sysop, you may wish to read the entire book to glean information and knowledge in the same manner as a new sysop. Of particular interest to existing sysops, however, are Chapters 8, 9, and 10. These chapters contain hints on operating and maximizing the potential of your BBS as well as your BBS business.

About the Disk

The disk contains a copy of The Bread Board System, TBBS. This bulletin board software from eSoft, Inc., allows you to run up to two telephone lines on any IBM-compatible PC using standard serial ports, requiring only DOS (no LAN multitasker or Microsoft Windows required) and less than 512k of RAM. This fully functional BBS software normally sells for $295; it's included with the book free. All features are included: electronic messaging with full-screen editor, file transfer areas with all major protocols including ZMODEM and Kermit, powerful questionnaires, a variety of information display methods, and real-time user-to-user chat facilities. (You may also receive complete documentation, a 45-minute introductory videotape, and the latest updates to the software, as well as qualify for technical support, for a small fee; refer to the coupon at the back of the book for details.)

1 Deciding Whether to Start a BBS

Many sysops start a BBS without fully appreciating the scope of the effort. This chapter is designed to help you both understand what's involved and avoid making a wrong decision that can be costly and time-consuming to correct later on.

By the time you complete this chapter, you should have an understanding of what a BBS can do. You should also have a good idea about the advantages of BBS technology, the types of BBSs, and the alternatives to a BBS. You'll also explore other options for solving your online needs, and you'll find out about the demands of creating and operating a BBS.

Understanding BBS Capabilities

Bulletin board systems have a wide range of applications, but all bulletin board applications are composed of one or more common functional components—a basic or core set of capabilities. Like every other aspect of computer technology, BBS technology is evolving to match the changing needs and wants of the people who use it. Still, what a BBS can do has not fundamentally changed in the over 15 years BBSs have been around. The capabilities fall into seven major categories: messaging, transferring files, displaying information, gathering information, teleconferencing, providing miscellaneous functions, and providing enhanced capabilities.

Messaging

Messaging encompasses two distinct forms of electronic communication: *e-mail* and *public message conferences*. E-mail is person-to-person, private communication. Most BBSs offer some form of e-mail. In a typical BBS environment, e-mail communication is readable only by the sender, the recipient, and the operator of the BBS (see Figure 1-1).

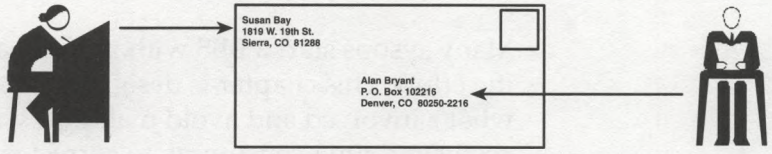

Figure 1-1
Only the sender and the recipient (and the sysop) can read e-mail

Public message conferences, also called *message boards* or *message areas*, are places where users of the BBS can communicate among themselves. Users can freely comment on the messages of other users, forming a roundtable discussion between the participants (see Figure 1-2). Most BBS software allows users to mark messages in a public area as *private*. Like e-mail, private messages can only be read by the sender, the recipient, and the BBS sysop.

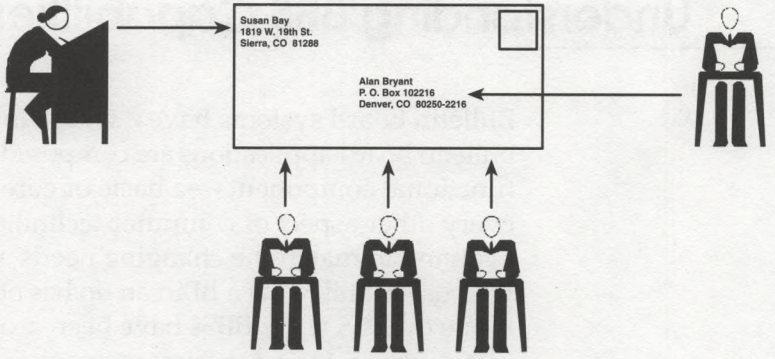

Figure 1-2
Public messages allow the involvement of many people

Message facilities are what most people associate with BBS. The free, open, and convenient communication a BBS offers its participants is extremely powerful. Users of the BBS are not constrained by the personal schedules of others they communicate with; the BBS stores messages for retrieval at the recipient's

convenience. The written communication lets people express themselves more thoughtfully than they might if they were speaking on the phone.

The downside of electronic messaging is that it lacks the visual and audible cues we're accustomed to in human communication. You can't see the people who posted the messages and you can't hear the emotion in their voices. This overdependence on words alone to convey a message sometimes leads to confusion and misunderstanding between participants. Users of BBSs need to be aware of these dynamics.

Sometimes message facilities are *networked*, meaning that messages leave your BBS and are delivered to other computer systems. This usually takes the form of networked e-mail, allowing users of your BBS to send messages to users of other BBSs, or to other types of systems entirely (such as MCI Mail users, CompuServe users, users accounts at university computing sites, and so on). FidoNet is the most established and the largest of the BBS networks. Today, however, many BBS operators are seeking out Internet e-mail access, since it connects millions of e-mail users on disparate computing platforms and systems worldwide. (I'll discuss these issues in more detail in Chapter 4.)

Transferring Files

Another popular feature of a BBS is *file transfer*, which allows users to obtain files from the BBS (*download*) or to send files to the BBS (*upload*). Many BBSs offer *file libraries*, which are collections of files for download. In fact, this constitutes a major reason companies operate a BBS. For example, a computer printer company may put a BBS online to distribute printer drivers for popular application software to its customers. Among publicly accessible BBSs, file libraries of *shareware* and *freeware* are always popular.

Most BBSs also offer private user-to-user file transfers, often called *file attachments* or *file enclosures*. Business associates may need to pass a written document in progress or spreadsheet between themselves. A BBS makes a perfect delivery mechanism for this type of function (see Figure 1-3).

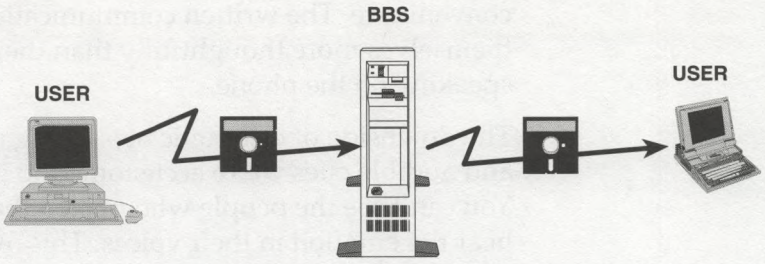

Figure 1-3
File transfer allows easy exchange of computer data and files by modem

The advantages of file transfers are clear; they let a wide audience of BBS users obtain copies of files at their convenience. One disadvantage of file transfer is speed. Transferring a file by modem is much slower than copying it via disk, so large files can take a significant amount of time to transfer to or from the BBS. Additionally, BBSs are often accused of being responsible for many computer virus problems, because files are easily transferred from user to user with little or no control imposed over the transfers. (Viruses and their relationship with BBSs are discussed in Chapter 8.) Many uninformed individuals may resist BBS technology because they incorrectly believe they are a haven for viruses, or that simply connecting to something via modem represents an infection risk.

Displaying Information

BBSs are often used as an *information-display* mechanism. That includes virtually any aspect of displaying information online to BBS callers, such as bulletins, news files, product information, technical help notes, meeting schedules, and more. Figure 1-4 shows a meeting announcement.

Many BBSs offer a *text searching* capability; virtually all offer several ways to display files. One advantage of information display is economy, since information can be posted once electronically, instead of copied on paper then mailed or handed out to recipients who might need the information. The on-demand nature of a BBS allows users to get the information they need, when they need it.

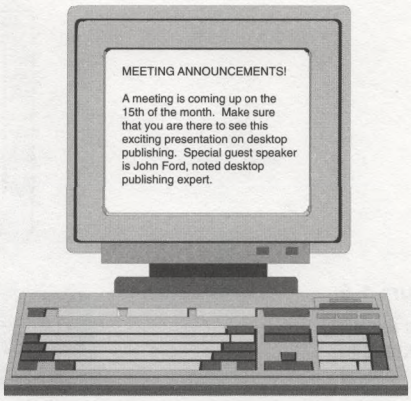
MEETING ANNOUNCEMENTS!
A meeting is coming up on the 15th of the month. Make sure that you are there to see this exciting presentation on desktop publishing. Special guest speaker is John Ford, noted desktop publishing expert.

Figure 1-4
Information display includes any type of online reading

The disadvantage of information display on a BBS is that the information is limited to text-based data. A spreadsheet or word processing document cannot be posted on a BBS for viewing online by callers unless it has been converted to plain ASCII text first. Information must be formatted for and is limited by the size of the typical computer screen, which restricts how information can be presented. Different fonts and character sizes simply cannot be translated to a BBS using available technology. Finally, information on the BBS is available only to modem users.

Some limitations on information display are being challenged. Methods of providing graphical online interfaces are emerging, expanding the information-display capabilities of BBSs to graphic images and fonts instead of plain 80-column by 24-line text. In the next few years, graphical online interfaces will likely be commonplace. (I discuss graphical technologies in Chapter 3.)

Gathering Information

A BBS is often used as a device for the collection of information. *Information gathering* consists of obtaining various types of input from the users of the BBS, and then saving or processing it. This can consist of questionnaires, such as online product registration, simple online ordering systems, matchmaking systems, and opinion surveys. In these systems, the BBS asks a question, as shown in Figure 1-5, and the user types a response that is saved

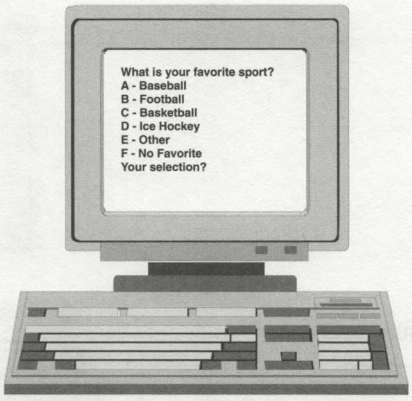

Figure 1-5
Information gathering allows users to type responses to questions online

to disk on the BBS. It may also include user polling or voting, where the BBS tabulates and summarizes the answers users have provided to multiple-choice questions.

Information gathering can be used as an adjunct to your BBS, or in the case of matchmaking systems, it can be the sole focus of the BBS. The advantages of information gathering on a BBS are that accuracy is assured (since users type and verify the information themselves) and that (with most BBS software) users can be forced to respond to a survey or questionnaire before being given access to the system or a particular portion of it. The disadvantages are that most BBS products allow only simple input verification (a user might be able to enter letters when asked for a phone number, for example) and that it's limited to the people who dial into the BBS (versus your whole customer base, membership roster, and so on).

Teleconferencing

Teleconferencing, also called *chat*, is a way for users of the BBS to communicate with each other in real time (that is, while they're connected to the BBS), as shown in Figure 1-6. It's the modem-based, typed equivalent of a conference call via telephone, and it applies only to BBSs that operate with more than one telephone line. In casual settings, teleconferencing often forms the focus of a BBS, serving as the center of an online social environment. In

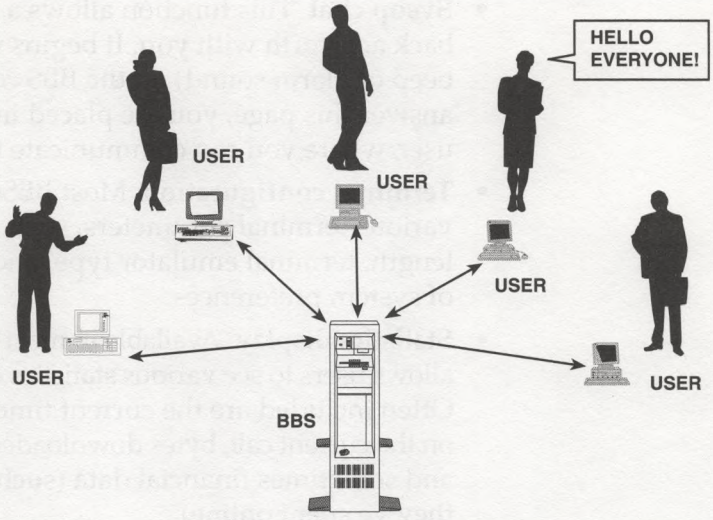

Figure 1-6

Teleconferencing allows users to participate in real-time roundtable discussions

business settings, teleconferencing is sometimes used for round-table discussions between associates and coworkers. Once users enter the teleconferencing feature, they can type back and forth to each other one on one or in groups.

The advantage of teleconferencing is that all the participants are on an even plane, without regard to race, gender, age, handicap, or any of the other visual cues that evoke prejudices and hinder our ability to communicate openly. The disadvantages of teleconferencing are the same as those for messaging features. The elements that make teleconferencing attractive—no visual or audible cues—also make successful communication a more challenging exercise, and misunderstandings are common.

Providing Miscellaneous Functions

A variety of miscellaneous functions are almost always a part of a BBS. These include various system utilities and convenience items:

- **Password change** This function allows users to change their system password (part of most BBSs) when they deem it necessary.

- **Sysop chat** This function allows a user to page you and type back and forth with you. It begins with a signal (some sort of beep or alarm sound) on the BBS computer. If you choose to answer this page, you are placed in a typing mode with the user, where you can communicate together.
- **Terminal configuration** Most BBSs allow a user to configure various terminal parameters, such as screen width and length, terminal emulator type, and in many cases a variety of system preferences.
- **Statistics display** Available in most BBS software, this function allows users to see various statistics about their user accounts. Often included are the current time, time logged on, time left on the current call, bytes downloaded, various current settings, and sometimes financial data (such as how much money they've spent online).
- **Caller list** This function allows a user to see a list of other people logged as users on the system. It is sometimes the entire caller log, and sometimes a limited list of the last several callers. Some BBSs even allow users to search the list. Others include personal information (height, weight, age, and so on) for social BBSs.
- **Who's online** This function lists the name (and usually the calling location) of users who are currently logged onto the system.

Most miscellaneous functions are taken for granted by sysops and BBS users, although they are clearly important to have available to your users. What specific functions are available and how they are implemented varies widely in various BBS software packages.

Providing Enhanced Capabilities

The final category is a catchall category called *enhanced capabilities*, which includes document retrieval, order-entry systems, online databases, and the like. These capabilities are usually implemented as add-on modules that enhance the basic BBS package.

Chapter 4 is devoted to enhanced capabilities.

The Advantages of BBS Technology

No matter what your reason for wanting to run a BBS, doing so offers an array of benefits that are difficult to resist:

- **Availability** Users can access a BBS when *they* want to. This is most important in a business setting, since the BBS is open all the time rather than only when there are people available to answer the phone. BBSs are an ideal way to provide service 24 hours a day without the expense of hiring a staff to be at the office those hours.
- **Time shifting** Any type of BBS that offers message facilities offers the benefit of time-shifted communication. A person doesn't have to be online, in town, or even awake to receive messages via a BBS from another user. Personal schedules need not be an impediment to communication.
- **Wide-area communication** A BBS can be accessed by anyone with a computer or data terminal, a modem, and a telephone line, regardless of where they are located. A 5,000-mile separation between people using a BBS is no different from being across the street from one another.
- **Electronic accuracy** When you use a BBS to distribute information to callers, you create and verify the information once. You can present technical information, computer files or programs, meeting schedules, and more with the assurance that recipients get the information as you posted it.
- **Unattended operation** One of the best aspects of a BBS is that you don't have to be there to run it. You start the system, and aside from checking it periodically and performing maintenance functions, it pretty much sits in the corner and does its job without babysitting.
- **Low cost** Relative to the alternatives, setting up and operating a BBS is an inexpensive proposition. Assuming that a computer and modem are already available for the job, you can set up a BBS for under $100. No other communications

tool can do so much for you or your organization for so little money.

- **Personal or professional empowerment** Most BBSs require only a single person to set up and operate. By setting up a BBS yourself, you can reach a wide audience with your opinions, your products, or your service. There are few other ways you can reach so many people with so little effort or cost.
- **An even playing field** BBSs allow people of any background to come together much more easily and comfortably than virtually any other way. Because a BBS masks things such as race or handicap that might otherwise evoke prejudices, people often communicate more openly via a BBS than they do in other situations.

Categories of Bulletin Board Systems

Millions of people around the world use BBS technology every day, and the number is growing rapidly. No matter where you're located, as long as you can get telephone service, your door is open to the electronic world. As someone who is considering the operation of a BBS, you probably fit into one of the following categories:

- **Hobbyist** You want to start and operate a BBS for your personal enjoyment. The reasons you first consider starting a BBS as a hobby are likely to range from "just because I can" to extensions of existing hobbies. For example, if you're a woodworker, you may start a BBS for woodworkers so you can find others who share your interests and talk about your experiences and trade secrets. You may also have more altruistic reasons, such as starting a BBS to educate the public about the AIDS epidemic.
- **Entrepreneurial** More and more BBSs are being started by people who want to provide a service to an audience and charge for its use. It's one of the few types of businesses that can be started on a shoestring budget, demand remarkably low overhead, be operated out of your home, serve large

numbers of customers, and require only one employee—you. Operating a BBS for profit is ideal as a sideline interest, because you can do it during your off-hours for extra money. As the business grows, you might find it becoming your sole focus and source of income. Many BBSs started in this fashion have grown to the point where their owners need to hire a staff to keep up with the system.

- **Business** Companies and organizations of all types are discovering the benefits of operating a BBS. The largest segment of the business community that benefits from BBSs is the computer industry. The availability of a technical-support BBS (or lack of it) is often one of the criteria by which computer companies are measured in product reviews. But you don't have to be a computer company (or even necessarily a high-tech company) to realize significant benefits from the operation of a BBS. Companies operate BBSs for various internal needs, such as store-sales reporting, e-mail, sales-personnel support, and technical databases.

INSIDER TIP. . . Entrepreneurial BBSs

Entrepreneurial BBSs are not the fast track to fame and fortune. Anyone who is considering starting a BBS as an entrepreneur should approach the effort with sufficient money to operate the system for at least two to three years. Although most systems quickly become self-sustaining, profitability takes much longer.

Assuming you are successful, most of the money you earn the first few years will be used to expand the system—not to finance new clothes and that hot PC you've always wanted on the desk in your den. Be realistic!

I also recommend keeping your expectations low. Many new business owners, including operators of entrepreneurial BBSs, have lofty expectations that simply don't make sense. Whatever you do, don't look at running a BBS as a source of quick cash. It never is. Success takes a lot of effort and is a long-term proposition, not one you will realize with a little work and a few weeks of patience.

The good news is that after your initial investment in hardware, the costs of operating a BBS consist mostly of phone bills and your time. Most BBS entrepreneurs who have the financial resources to pay the phone bill each month can stick it out for quite some time with little or no income from the system. Provided you carefully manage expansion (adding things to your system over time to keep up with user demands), the average person considering a BBS who is gainfully employed (outside his or her BBS) should be able to keep going for quite a long time.

For the most part, BBS operators of any type share common goals and interests. However, these different categories sometimes have different needs and ways to address them; where appropriate, I refer to these groups elsewhere in this book.

Understanding BBS Alternatives

You already know that a BBS can provide services such as electronic messaging, file transfers, information display, information gathering, and teleconferencing. At first glance, many logical extensions to these basic elements may seem like a perfect match with BBS technology. In practice, some are a perfect match and others are not.

To draw an analogy, you may look at a car and see "transportation." To someone who has never seen a car before, it may seem perfectly logical to want a car to grow wings and fly swiftly through the air, or grow a round underbelly and speed across the surface of a lake or ocean. After all, these things all have an engine, all of them hold and are controlled by people, and all of them get you from one place to another. Of course, we all know that cars, planes, and boats have different designs and different purposes.

Like a car, a BBS is flexible, comes in many different varieties, and can be used for dozens (if not hundreds) of different functions. It is not, however, the perfect match for all telecommunications needs any more than a car is the perfect match for all transportation needs. If you need to haul things across land, you buy a truck. If you want to fly through the air, you buy a plane. The following sections are designed to help you understand how and why "obvious" extensions to a BBS don't make sense.

Remote Hosting

A BBS is not a remote hosting system. *Remote hosting* is a method of remotely accessing a computer's functions. At first blush, this sounds just like a BBS. However, remote hosting usually has a

more involved purpose. For example, if you want to run computer applications software (such as a word processor or spreadsheet) remotely from another site via modem, complete with full keyboard and mouse control (see Figure 1-7), you're really in the market for remote-hosting software.

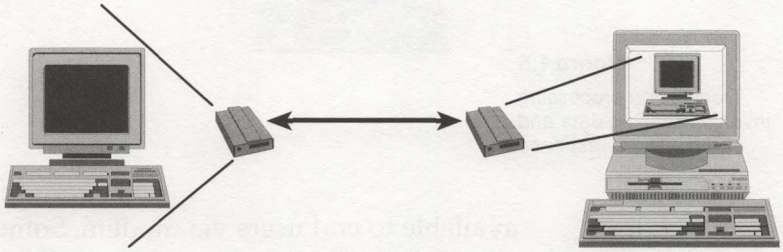

Figure 1-7
Remote hosting involves taking control of a remote computer

Some types of BBS software (discussed in Chapter 3) allow remote execution of some types of programs. This functionality, called a *door*, is a limited type of remote hosting but should not be confused with full-function remote hosting. If you expect full control of all aspects of the host PC, including running programs and copying files, along with full I/O redirection (full keyboard and mouse control, support for all text and graphics video modes), then a BBS is not suitable for your needs, and you should purchase remote-hosting software instead.

Transaction Processing

Transaction processing is a vast category of computer technology. Generally, it refers to any situation where a user inputs information, and a computer host processes this information and returns a response in real time (immediately) that is dependent upon the information that was put in. Examples of transaction processing include airline reservation systems (shown in Figure 1-8), computer systems used by bank tellers to process your financial transactions, and point-of-sale systems (such as electronic cash registers).

Many people confuse transaction processing with a BBS because they want to make some sort of transaction-processing system

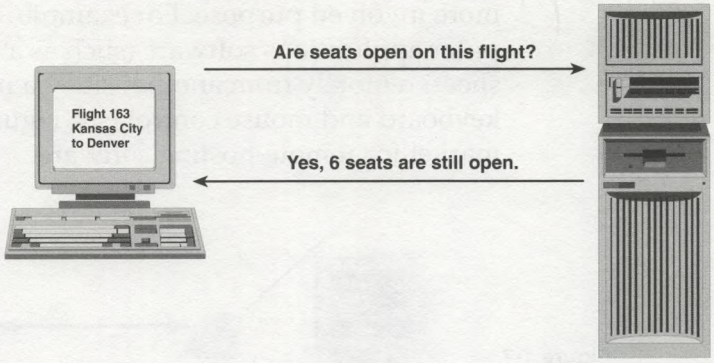

Figure 1.8
Transaction processing involves sending data and receiving a response

available to end users via modem. Some BBSs can handle some types of transaction processing, such as online order systems, but several issues are involved.

For example, does the BBS's transaction-processing system need to integrate with one outside the BBS? Is the outside system PC-based, or is it on a minicomputer or mainframe? Does the system need real-time secondary processing, such as credit-card verification? Can the BBS's system be interfaced with other systems in your organization or business?

In most cases, a BBS is only marginally appropriate for most transaction-processing applications. Even when a BBS can be a front end for a transaction-processing system, it usually requires custom software.

Remote LAN Access

Operators of local area networks (LANs) often want LAN users to be able to access the LAN from a remote location. For example, a salesperson in the field may need to access the latest inventory information held in a database normally accessed from LAN-based PCs, or to send a message to a coworker via the LAN e-mail system. This is called *remote LAN access*.

Some BBSs have access to certain LAN functions. For example, some offer *e-mail gateways* where BBS users can send e-mail to LAN users through the BBS. The door functionality of some BBS software may also provide limited access to LAN-based applications.

Remote-hosting software can provide some remote LAN access, but a full-function remote LAN access facility requires special hardware and software that is different from what a BBS can offer you. Vendors of LAN hardware and software are good sources of information on remote LAN access.

Personal File Transfers

You might need to simply grab a file or two from your home or office PC while you're away. You may also want to send a file to a few of your associates via modem. For this type of application, a BBS is certainly suitable; however, it's a lot more software than you really need.

For this type of situation, the *host mode* of ordinary telecommunications software is probably adequate. Host modes provide simple, stripped-down BBS-like capabilities for situations where you don't need the full power of a BBS. Basic access controls (security), file transfers, and simple e-mail facilities are usually provided. Virtually all major modem software packages, such as Procomm, Crosstalk, and Microphone II, offer a host mode.

Electronic Mail Systems

Computers are increasingly being used for electronic communication. This technology is referred to as *electronic mail* or *e-mail*. Many different types of electronic mail are available; which one is best depends on your situation.

Commercial online services, such as CompuServe and America Online, offer e-mail services between members, as well as gateways that allow you to send mail to other e-mail services. Local area networks, such as Novell NetWare, offer e-mail services to LAN-based workstations. Many long-distance companies offer electronic mail via modem, one of the most popular being MCI Mail. The Internet (a loose global collection of computer systems) offers worldwide electronic mail capabilities to education, research, and business via institutional and commercial vendors.

All BBSs offer a form of electronic mail. Gateway software for many BBS products is also coming onto the scene, allowing BBS users to send e-mail to LANs, commercial online services, BBS networks, and the Internet. However, a BBS is not always the best choice when e-mail is the sole focus of the problem you're trying to solve.

Multiuser Operating Systems

With the rapid growth of the Internet, many telecommunicators are subscribing to systems that provide interactive Internet services. Typically, these services are offered by institutions or companies in the form of accounts on UNIX-based minicomputers. Modem users dial up the UNIX system and log in. Once they are logged in, access to e-mail, file transfers, chat, remote-system gateways, and remote file transfer is provided. In many respects, these services are similar (or in some cases identical) to those offered by a BBS. In reality, users of these systems are simply users on a large multiuser operating system (UNIX). Table 1-1 compares the features of a multiuser operating system and a BBS.

BBSs are generally much less technically involved and are significantly more user-friendly than accounts on a UNIX system. Although there is overlap between the two, a BBS is the best choice when overall ease of setup and use is of paramount importance, and where cost is an issue. In situations where e-mail connectivity is critical, full-function Internet access is required, or a command-line–driven and highly technical interface is acceptable, then setting up a UNIX system (or buying the services of one) might be an alternative to a BBS.

Although somewhat blurry now, the distinction between the services of a UNIX system and a BBS will blur even more, with each offering more of the services and features of the other. BBS gateways to Internet e-mail, long the bastion of UNIX users, are rapidly becoming commonly available along with such technologies as remote BBS logins via Internet. UNIX systems are getting easier to use, with some menus and interfaces available now.

Table 1-1
Comparison of Features between a Multiuser Operating System and a BBS

	Multiuser Operating System	Bulletin Board System
Remote hosting of executable programs	✓	½✓ [1]
User normally has access to operating system functions (file create, delete, copy, rename, and so on)	✓	
Multitasking inherent in system	✓	½✓ [2]
BBS-style functions (e-mail, file transfer, and so on) each implemented as separate, replaceable programs	✓	
Each user assigned a home file directory	✓	
User interface designed with BBS functions in mind		✓
Command interface from operating system prompt	✓	
Usable by highly technical people	✓	✓
Usable by nontechnical people without training		✓ [3]
Inexpensive to install and maintain		✓ [4]

[1] With multinode BBS software or through gateways only.
[2] Only with integrated BBS software.
[3] In most cases, a BBS can be used with little or no special training on the BBS itself.
[4] DOS-based BBSs.

To further confuse the distinction, some BBS software runs on UNIX-based computers offering a unique blend of traditional BBS functions and ease of use with UNIX's advanced connectivity options. (I'll talk about some of this software in Chapter 3.)

Generally speaking, setting up a typical BBS is much more cost-effective than setting up a UNIX system and allowing account access to it via modem.

Exploring Other Options

For computer hobbyists and those wanting to operate their own business, the choices have more to do with what BBS software to pick than anything else. For those starting a BBS for use with their business, many people do (and should) consider two common alternatives to BBS technology.

When you are studying whether a BBS is the right choice, you have several factors to think about. The most important is cost: how much does it *really* cost to get a BBS online versus some other approach? (I'll discuss the real costs of a BBS in Chapter 2.) Other common considerations include operating control (how much control do you want or need?) and accessibility (what does it take to get to the information online?). All of these elements must be carefully studied, as the answers may not always be as simple as they seem.

Commercial Online Services

Many companies, especially those that want to operate a BBS for customer support, may consider contracting with a major online service for their online needs rather than setting up a BBS on their own. There are many compelling reasons to do this, and just as many compelling reasons not to.

One of the primary reasons for going with an online service is accessibility. Most of these services, such as CompuServe, GEnie, America Online, and Delphi, are available virtually worldwide. They accomplish this feat through *packet-switched data networks*, private data connection services available almost anywhere telephone service is available. Probably the largest of these services is BT North America (formerly Tymnet), a unit of British Telecom. This network spans the globe, with access via modem, a local telephone call away in nearly all major cities. (As I'll discuss in Chapter 6, you can also connect your BBS to such a network for the same wide accessibility.)

Another advantage of going with an online service is that its staff handles all of the dirty work, and it's taken care of on the online service's computers, not yours. This means you don't have to devote staff to the operation of a BBS, and you don't have any equipment or software to purchase or maintain on your own.

As attractive as these reasons are, there are just as many reasons not to go with an online service. The biggest reason is cost. Setting up a BBS, including the cost of hardware and software, is usually a bargain compared to the up-front setup costs of a

section on an existing commercial online service. It's not unusual to pay $5,000 to $10,000 (or more) to get set up with an online service, depending on what your needs are. A BBS with even 16 incoming lines is much less expensive to set up, and a basic BBS can cost just a few hundred dollars.

Ongoing costs are another issue. Commercial online services require accounts for their users, who are billed according to system usage and may have monthly minimum charges. In closed environments (access is for your company and its employees only), the company must finance one account each for all of the personnel who need access. It is often more cost-effective to have your people dial your BBS directly over regular phone lines (even long distance) than pay by the hour for connections to an online service at rates as high as $20 an hour.

In public settings, where you want to support your customers and perhaps serve as a source of information for prospective customers, an online service has another disadvantage: It's available only to members of the online service. If a particular modem user doesn't have an account with the online service, he or she cannot contact you or access information you might have available. Even users who do have accounts must pay the online service for usage, often at rates far higher than a direct-dial long-distance call to a BBS.

Another disadvantage of an online service is control, or lack of it. If you want changes in how your information is presented, you usually have to pay the online service to make the changes for you. With your own BBS, you are in control and can make changes whenever you want or need them.

If you want to reach the general public, going with a commercial online service is generally appealing only to computer hardware and software companies, whose modem-using customers probably already pay for access to one or more major online services. However, those that don't have an account on the service you select will be locked out from reaching you electronically. Non-computer companies will have fewer modem-using customers to begin with, and a BBS is the most cost-effective way to go online and reach these customers.

In practice, most companies that go with an online service operate a BBS as well. Proceed carefully before you go this route—contracts with commercial online services often severely limit what types of services you can provide on your BBS, or even whether you're allowed to operate a BBS at all. If you don't choose to start a BBS now, I recommend you keep your options open by negotiating out of your contract any limitations on the running of a BBS.

Finally, it's a common misconception that operating a BBS takes one or more full-time employees to manage. In practice, operating a BBS doesn't require adding employees at all. In fact, the part-time attention of an existing employee is all the care and feeding a BBS usually requires, except in the most unusual of circumstances. I'll talk more about what a BBS demands from you later in this chapter, and in Chapter 2.

Terminal-Software Host Modes

If simple file transfers are all that your business requires, then a BBS may be more software than you need. If, for example, you operate a service bureau (such as a slide printer, or a desktop publishing or typesetting shop) and need clients to dial in and upload work for your company to process, then you should consider using terminal software in *host mode*.

Software such as Procomm Plus and Microphone II offers sophisticated host modes. These modes act as a simple, single-line BBS-like front end for access to your PC via modem. The host modes of most communications software offer basic access controls (so it's not an open door to your hard disk), simple e-mail facilities, and file transfers.

If the volume of usage is low enough, you may be able to get away with running the host-mode software on demand. Your customers can call in advance by voice phone to let you know they need to send materials to you, and you can load the communications software at that time.

The advantage of using the host mode of a communications package is cost. Terminal software is usually much less expensive

INSIDER TIP. . . Host Mode Trade-Offs

Terminal-program host modes are usually useful only in situations where you do not need full-time accessibility of the system you set up. If you are in need of 24-hour accessibility, or if you need to provide access to your system to the general public, you should consider using BBS software even if your needs are fairly simple.

The primary reasons are control and flexibility. Although the host modes of some terminal programs are nearly complete BBSs themselves, that's not the reason they were created. It's rather like owning a phone booth instead of a home. Both give you shelter, but one was meant for a residence and one was meant as a place to make a phone call. In much the same fashion, BBSs are designed specifically for remote access via modem, and terminal software is meant for outward modem dialing. As such, you often forfeit features when using the host mode of a terminal program instead of a BBS, and you potentially forfeit control and security as well.

Unless your needs are especially simple, and unless you want only on-demand access to your system (you start it up when someone needs to call), I strongly recommend you consider running BBS software instead of terminal software in host mode.

One of the most common situations where using a host mode makes sense is in a low-volume service bureau. Typesetters, slide printers, imaging companies, and others often use terminal-software host modes instead of a BBS. Customers can simply call in when they need to transmit a job, and the host mode can be brought online. Often, a dedicated phone line isn't even used—the host mode software shares a voice line with the business. This is one of the few cases where *not* using BBS software makes sense for your remote-access needs.

than BBS software, and in situations where it can run on demand, it means that you don't have to dedicate a valuable PC to the task.

Even in the environments where terminal-software host mode might make sense, many companies prefer the more sophisticated features and interface that only a true BBS software package can provide.

Grasping the Demands of a BBS

When you make the decision to start a BBS, it's difficult to gain an understanding of what the project is going to demand from you. How much time will it take to set one up? How much time

out of every day will it take to operate it? Will I require assistance (or more employees!) to get the job done?

The unfortunate truth is that the answers to these and other questions depend in large part on the specific application you have for BBS technology. Many BBSs take just a few minutes a day to maintain, but others can easily keep a small staff of people quite busy. Thankfully, most BBSs need no more than the part-time attention of one person. Of course, if you are operating a BBS as a hobby, then you are free to spend as little or as much of your time as you wish operating the system (and your BBS will happily work with you in this regard, taking everything you'd like to give it in the way of your personal time).

What's Involved with BBS Setup

Setting up a BBS consists of two elements: planning and installation.

One common mistake among people setting up a BBS is to not plan it thoroughly enough. This book is (among other things) your planning guide; by reading it and applying the information it offers, you'll have a good understanding of what's involved in planning a BBS. Planning includes the assessment of your needs, investigation of available software, anticipating growth and how you intend to cope with it, and outlining how you intend to ensure your success. It may also include operational procedures and policies for your system.

One of the most important aspects of planning is the *theme* of the BBS, which I'll talk about in more detail in Chapter 2. Deciding on a theme will guide much of the remainder of your planning. If you are a horticulturist, you might be interested in starting a BBS on gardening. If you decide that's your theme, then you'll know immediately that selling coffee on your BBS is a bit inconsistent with that theme. It might also help guide decisions such as the number of telephone lines you need coming into your system. A narrow, focused theme needs fewer lines (at least initially) than something more broad-based.

Planning also includes such things as analyzing, selecting, and costing out hardware and software for your BBS, determining

how many lines you need for the system and what types of connections will be offered, making strategic plans for future expansion, and if you're an entrepreneurial sysop, creating a full-blown business plan.

Installation is the physical addition of the BBS software to your computer, as well as the configuration and tuning of the software once it's in place. It also may include the addition of hardware to your computer (such as additional serial ports) and the connection of modems, local area networks, and the like.

Time Demands of Planning a BBS

Regardless of your intended use for a BBS, planning is important. A failure to plan adequately now might mean scrapping your initial effort later on, and changes down the road are often extremely costly and (as regards user satisfaction) potentially risky.

Hobbyist sysops aren't obligated to plan; in fact, much of the fun and adventure of the BBS hobby is finding out where you're going when you arrive. However, even the hobbyist sysop can benefit from at least knowing why he or she has decided to start a BBS, and you should devote some time to thinking about and understanding your motives, how much money you can spend, and how much time is available for the BBS. The hobbyist sysop can take as little or as much time planning as needed.

For entrepreneurial sysops, planning is absolutely critical for a successful BBS. The BBS *is* the business itself, rather than an outgrowth from it. A full business plan is appropriate, and Chapter 10 will assist you in creating one. The plan needs to include not only what belongs on the BBS (will I offer file downloads?) but also how everything is to be financed (how long can I afford to operate the system?). An entrepreneurial sysop should plan on three to six months for proper and complete planning, although installation can take place in tandem with planning once you select the software.

For business sysops, simply stating a goal or reason for starting the system is a beginning. From there, you decide what functions the BBS needs to provide to fulfill the stated goal, who is going

to install the system, who is going to run it, and how much attention it is expected to demand. Business sysops should set aside one or two months for planning; possibly more, if the project must receive approval from committees or management.

Time Demands of Installing a BBS

The amount of time required to install a BBS varies with both your intended application and the software you select. It can take just a few minutes to get a system on the air using default setups for nearly every commercial BBS package. Customizing the system to your needs is said by some to be a never-ending process, but from a standing start a BBS can be ready for the public in as little as a few days, and as much as a few months.

Your intended application is the first element that affects the amount of time it takes to install a BBS. Service bureaus, which need only simple file-transfer facilities and possibly basic e-mail, represent the simplest of systems. With virtually any BBS package available, a system this simple—basically two functions—represents only a few hours of effort to install and configure.

Technical-support BBSs are generally more involved and are somewhat variable. Most technical-support BBSs offer file libraries exclusively. Setup consists of adding files to the system, organizing and arranging them, and making them available to callers. Many technical-support BBSs also offer other features, such as message areas. These need to be planned and configured as well. Items such as technical help notes may need to be brought into a plain-text format, and must also be placed online and arranged for convenient and logical access.

Most business-oriented systems require about one month of effort (not necessarily full-time effort) to be ready for callers. The more functions you need to offer, the more time it will take.

Entrepreneurial sysops should plan on more time for installation and configuration. Although a basic system can be ready within a month in most cases, complicated systems with more features can easily take several months to organize, prepare, and implement. Systems operated as a business are the most delicate of

any BBS, in the sense that callers must find the system inviting and pleasant in its presentation and arranged in such a way as to make finding things easy. These more complex demands also require more time in setup.

For hobbyist sysops, configuring and enhancing the system constitutes much of the enjoyment of the endeavor. A basic system can be online in very little time—a week or two is realistic. The configuration effort is ongoing and should be viewed as part of the reason you took up the BBS hobby. In this regard, hobbyist sysops should consider software that offers them the greatest ability to tune the system in the ways they expect and desire.

For many hobbyist sysops, operating a BBS is the hobby. For others, it is merely an extension to an existing hobby. For such sysops, the time demands of a BBS are more similar to those that the entrepreneurial or business sysop faces since the BBS is a sideline interest rather than a primary one.

Summary

After reading this chapter, you should understand the following concepts:

- BBS capabilities include messaging, file transfer, information display, information gathering, and teleconferencing. Some BBSs have enhanced capabilities, either built in or as options, that offer other types of functions.
- The advantages of a BBS include availability, time-shifting, wide-area communications, electronic accuracy, unattended operation, low cost, personal empowerment, and an even playing field for participants.
- BBSs generally fit into one of three categories: hobbyist, entrepreneurial, and business. The business category includes organizations (such as nonprofits).
- Alternatives to a BBS include remote hosting, transaction processing, remote LAN access, personal file transfers (host

mode), electronic-mail systems, and multiuser operating systems. If you're interested in one of these options, think carefully whether a BBS is right for you.

- Many people consider a commercial online service or the use of terminal software in host mode instead of running a BBS.
- You should understand what's involved in setting up a BBS, and the amount of time it will take you to plan and install it.

Worksheet 1: Deciding Whether to Start a BBS

Which elements of a BBS are you planning to use?

- ❑ Message facilities
  - ❑ Private e-mail
  - ❑ Public message conferences
- ❑ File transfer
  - ❑ File libraries for access by all users
  - ❑ Private file areas
  - ❑ Private user-to-user file transfer
- ❑ Information display
  - ❑ Bulletins
  - ❑ News and information
  - ❑ Other (specify) _____
- ❑ Information gathering
  - ❑ New-user questionnaires (obtain information about your users)
  - ❑ Surveys (polling users about their preferences)
  - ❑ Simple online ordering
  - ❑ Other (specify) _____
- ❑ Teleconferencing
  - ❑ Public chat conferences
  - ❑ Private user-to-user conferences
- ❑ Miscellaneous
  - ❑ Password change
  - ❑ Sysop chat
  - ❑ Terminal configuration
  - ❑ Statistics display
  - ❑ Caller list
  - ❑ Who's online
  - ❑ Other (specify) _____

What type of BBS are you planning to run?

- ❑ Hobbyist
- ❑ Entrepreneurial
- ❑ Business

Check off any BBS alternatives you feel you should consider more closely before you set up a BBS. Spend some time thinking about other alternatives, and list them here.

- ❑ Remote hosting (remote running of programs)
- ❑ Transaction processing (ordering systems, data entry, and so on)
- ❑ Remote LAN access (remote access to LAN e-mail, programs, and so on)
- ❑ Personal file transfers (terminal-software host modes)
- ❑ Electronic mail systems (online services, Internet, MCI Mail, and so on)
- ❑ Multiuser operating systems (UNIX, and so on)
- ❑ Other (specify) _____

Other options include online services and host modes. Place a check next to any options you feel might fit your situation, and explore them in more detail.

- ❑ Commercial online services (CompuServe, America Online, Delphi, and so on)
- ❑ Host modes (Procomm Plus, Crosstalk, and so on)

Using the information in this chapter as a guide, estimate the amount of time you expect to spend getting your BBS going:

Planning _____ ❑ Weeks ❑ Months

Average planning times:

Hobbyist	0 to 1 months
Entrepreneur	3 to 6 months
Business	1 to 2 months

Installing _____ ❑ Weeks ❑ Months

Average installation times:

Simple system	1 to 4 weeks
Average system	3 to 6 weeks
Complex system	1 to 3 months

2

Planning Your BBS

Building a BBS entails a great deal of research. Many BBSs fail in a variety of ways because their operators fail to research what's required and how much it costs. This chapter is designed to aid you in your initial research effort.

You'll learn about the impact a BBS has on your life in terms of time, cost, space, and the demands of user support. You'll explore how to plan your system, and how to develop a theme for it. You'll look into how the work gets done, as well as how much a BBS actually costs to create and operate. Finally, you'll learn how to anticipate future growth.

Integrating a BBS with Your Life

Many people entering the world of operating a BBS don't stop during the initial stages to think about the impact of a BBS on their lifestyle. For entrepreneurial and hobbyist sysops, who probably operate the system out of the home, this is a critically important consideration. But even if you're a business sysop, the BBS is probably not the sole focus of your work, and you still need to get your regular job done.

The ongoing operation of a BBS can demand a fair amount of your time, depending on what type of system you operate and how involved it is. When you think about the impact of a BBS on your life, time is probably the biggest single factor, and it takes several different forms. Other issues include ongoing costs, physical space availability, placement of the system, and supporting your users.

The Impact of Time

There's no getting around the fact that operating a BBS takes time. It takes time to plan it, time to install it, and time to operate and maintain it. Many people considering a BBS worry quite justifiably about time. Depending on your situation, a BBS can take just a couple of hours a week, or it can keep an entire staff busy every day. Thankfully, the average BBS can be operated by a single individual with just a few hours a week to give to the job.

To help you assess how much time your BBS will take, it's important to understand that once the system is installed, your time will be consumed in five basic ways: user maintenance, file maintenance, message maintenance, general system maintenance, and management functions.

User maintenance is the handling of user accounts. If you allow people to dial your system openly, then you'll have the burden of authorizing users to access your system more fully once you've confirmed their identity or received payment from them. If you run a *closed system*, one where new users are not allowed, then you'll have to add users to your system manually when necessary. User maintenance can take just a few minutes a day for slow systems, or several hours a day for busy systems or situations where you have accounting or billing functions to handle as well. It averages an hour or two per week.

File maintenance pertains only to systems that offer file transfers. If you allow users to upload files to your system, you'll need to spend time checking them for quality and viruses (if desired) and moving them to their proper directories or sections on the system. Even if you don't allow uploads, file maintenance may still apply. If you have files such as drivers or technical help notes posted, then you'll have to keep this information current and add to it as necessary. Except on busy file systems, this is not a daily activity; planning an hour a week for this task is probably adequate in most cases.

Message maintenance refers to the reading of and posting of replies to messages. If your system doesn't have any message features, then of course this won't take any of your time. On busy systems, it can take several hours a day to get the job done,

and may in some cases require the effort of several people. This function requires daily attention to keep messages from getting backed up in the system, much like the pile of "while you were out" notes that are waiting for you when you return to the office from vacation! Plan two to six hours per week depending on your circumstances.

General system maintenance includes any direct system interaction that doesn't fit into the preceding categories. This might include such things as creating or monitoring user surveys and questionnaires, making changes to the system's configuration or menus, adding new features to the system (such as new message areas, file areas, or programs), adding more lines and modems, upgrading hardware, and so on. The amount of time this requires varies widely; some weeks you won't do anything, and some weeks you'll spend dozens of hours on the task. Plan on this category consuming an hour or two a week on average.

The final category, *management functions*, refers to activities involved with the BBS but not directly handled by it. This might include things like calling users to verify their identity, generating and preparing billing statements, sending new-user materials or promotional items, fielding user complaints, reading books (like this one!) or trade publications (such as *Boardwatch Magazine*) to stay informed, and so on. The amount of time to set aside for this category varies depending on your situation, but plan on a couple of hours a week on average.

The Impact of Cost

If you're a hobbyist sysop, then the amount of money you spend on your BBS depends on what you're willing to put forth. Like almost any hobby, it can take as little or as much of your spare cash as you let it. Once the system is started, however, most of the ongoing costs are for the telephone line(s) you have connected to the BBS. When you choose to add more features, upgrade software, or add a phone line, you'll be increasing your costs.

Entrepreneurial sysops should figure adequate funding into their business plans for operating expenses and expansion. Most BBSs aren't successful unless they are perceived as dynamic and

growing. Some of that perception comes from adding new things to the system or increasing the number of lines connected to it. You should make adequate plans for these types of expenses as well as for operating expenses (such as telephone lines, office supplies, and so on). You should also have plans in place to deal with catastrophes, such as a hard disk crash or modem failure. (Insurance is a good idea, too. There's nothing like a lightning strike to ruin your day and every piece of equipment in your office or den, not to mention your business!)

Business sysops don't need to plan for much other than basic operating expenses (telephone lines) and the salary of the person (or people) who'll be responsible for running the BBS. Most business BBSs, such as technical-support boards, aren't especially dynamic. They are set up to address a particular need, and unless the need changes, the BBS won't necessarily need to change much either. Whatever is required to ensure that the system stays online and operational is the extent of ongoing costs for such a system.

The Impact of Space

Another area that many potential sysops fail to consider is space: "Where am I going to put this thing?!" To some degree, this is dictated by the number of lines you intend to operate the BBS with, and what type of software platform you select. For more on those options, see Chapter 3.

Presuming that there's a back office or spare closet somewhere, the average business won't have to worry too much about space. Wherever the system is located, you should make sure that there is convenient access to it for those staff members who need to maintain it. Large companies often locate their BBSs in computer centers right next to the mainframes and minicomputers that are the lifeblood of the MIS department. This often entails access restrictions (security clearances, locked doors, and so on) that may hamper your ability to interact with the system when necessary. PC-based bulletin board systems can really be located anywhere it's convenient and where telephone lines can be located easily.

Entrepreneurial sysops as well as hobbyist sysops usually locate their BBS in their own home. As with any business or hobby, you'll almost always need more space than you think. Select a location where telephone lines can easily be installed, where you have plenty of room to stack equipment and access the system, and where you have space to perform your management functions (such as mailing bills or calling users on the phone).

A BBS can easily get out of hand. I know many people whose small homes or apartments are dominated by their BBSs. If you're extremely limited on space, you can virtually count on the BBS and its ancillary equipment and materials consuming you and your home. What may seem like a simple computer with a modem attached may start out there, but it'll quickly grow into a monster. Plan on it, and select an area from day one that can accommodate that growth.

Finally, it's important to realize that the software you select will affect to what extreme your BBS will dominate your space. If your BBS software operates on a single computer, then that one computer will be the primary piece of equipment. If your BBS software is multinode, make sure you have plenty of room to fit the multiple computers that will comprise your system, and room around and behind things to get at the required LAN and power cabling. In extreme cases, you may need to consider renting office space to put the system in rather than locating it in your home—unless you're willing to devote your entire basement to the BBS. (For more information about the various types of BBS software, see Chapter 3.)

INSIDER TIP. . . The Impact of User Support

One aspect of the impact on your life that many people fail to realize at the outset is that of user support. Your callers will often look to you for guidance, advice, and assistance. You need to be aware of this dynamic, and be prepared to handle it.

The impact of support is strongest in the technical arena. Whether you like it or not, when you open a BBS you're also opening a technical-support department for your users. You'll discover once you're online that many of your users are new to modem communications. In some

cases, yours may be the first online system they've ever dialed. When they have trouble, they're not apt to call their modem vendor or the software company that made their communications program. Instead, they're going to call you.

Hobbyist sysops justifiably attempt to keep a low profile. If you're a hobbyist, you're in this for fun, and playing technical-support representative isn't a lot of fun. I recommend that you keep your personal phone number unlisted, and make sure that you do not post the number on your BBS—unless, of course, you're willing and able to help your users at any time of the day or night. Even if you think you're willing now, proceed with caution. Many sysops grow weary of the burden after only a short time.

For entrepreneurial and business sysops, those pesky neophyte users are your *customers*, and that entitles them to some level of service, especially since they're directly or indirectly paying for the privilege of accessing your system. Before you put the system online, before you even pick the software to use, make sure you decide and know how you're going to handle user-support issues.

In a business setting, your users will likely find you one way or another, usually by simply calling your main office number.

Entrepreneurs might consider installing a voice line for your fledgling business and offering voice assistance to your paying users. This is a feature many of your paying customers will be looking for. Make sure you advertise the fact on new-user screens and follow-up materials; users are much more likely to send you their money when they know there's a real, live person behind the modem connection.

Regardless of what type of system you run, make sure you treat your users with respect and courtesy, no matter how aggravating they may be to talk to. You'll learn more about handling your users in Chapter 8.

Getting Started with Planning

As I discussed in Chapter 1, one of the single most important aspects of the process of starting a BBS is planning. Although it may seem like a rather simple matter, planning is more than just saying to yourself, "I need remote access to data via modem, and a BBS is a great way to handle it." Planning is composed of many elements.

It's important for you to remember that the time you spend planning, even at the low level covered in this chapter, is time you'll save later correcting problems. The single biggest mistake that potential sysops make is to not plan thoroughly enough. It's too easy to assume that this is just a simple software installation,

like any other. You didn't have all that much trouble deciding on and installing your word processor, so (the logic goes) why should picking and installing BBS software be any different? I can assure you, it's very different indeed.

At this first stage of the planning process, you make some fundamental decisions and realizations you'll live with for the duration of your BBS's life. Understand the importance and magnitude of this planning, and treat it accordingly.

Developing a Theme for Your BBS

As I mentioned briefly in Chapter 1, developing a theme for your BBS is probably the single most important outcome of your planning effort. Developing your theme early on will guide the remainder of your planning and will serve as a focus for the design and construction of the BBS.

Themes for Business BBSs

Business BBSs don't have themes in the same sense that other BBSs do. Still, it's important to have a handle on what you're planning to accomplish—a focus for your efforts. I prefer to call this focus a *theme* because, as with any other type of BBS, it guides the many decisions you make regarding your system, both your own issues that callers won't see, and issues concerning things that callers do see when they dial the BBS.

Developing a theme for a business BBS may be as simple as selecting an appropriate name for the system. If your company is named MegaWidget, Inc., then calling your system Widgets Online may be fine. Exploiting the name of the BBS in company literature and on the BBS will help create among callers the important feeling of being someplace when they call your system.

You may already have a name for your system in mind. If you don't, then spend some time thinking about the purpose of your system. Thinking about it in simple terms, then honing it down

to a single sentence, usually yields acceptable names. Is your purpose to distribute technical information to your customers? (Doe, Inc., TechLine might work.) For your managers to discuss company issues among themselves? (The name might be Doe, Inc., Management Connection.) For employees to access a database of company benefits? (Doe, Inc., Online Employee Center is one possible name.) A name doesn't have to be catchy; it merely must reflect what company owns the system and what the purpose of the system is.

Whatever you name your BBS, make sure that the system lives up to the expectations of your callers. Let's take the case of a BBS called Doe, Inc., TechLine, whose goal and theme is to provide technical product information for Doe, Inc., products. Callers will expect technical information to be available on a wide range of subjects that pertain to those products. But if there's only a handful of files with technical information, the BBS won't end up being a successful endeavor, because it won't be living up to its name. If you find you selected a name too broad in its scope, change it.

Once you've established the name for your system, adopt it as your theme. Adjust the name to give it a little more zest if it seems a little dull; you might want the theme to be something that excites you and your callers to some degree in addition to stating the focus of the system. As you progress through the planning of your BBS, make sure your decisions about the system match the theme.

For example, if you put a business BBS online to allow your customers to submit work to your company (such as in a service bureau setting), then your theme will reflect a need to provide that functionality in the easiest and simplest way possible. Maybe the name of the system is Desktop Systems Customer Upload Service. Given that, it probably wouldn't be appropriate for a system with those goals to provide message areas to discuss politics or to provide massive file areas with lots of downloads, even if those things have personal appeal for you.

A theme for a business BBS doesn't have to come in the form of a name for the system, especially if the purpose of the system is

somewhat involved. It may be best to simply name your system after the company (Doe, Inc., BBS) and think of the theme in other terms. In this case, begin by listing the services that the system is intended to provide its callers. If possible, narrow that list down to a sentence or two, something that will be easy for you to remember as you proceed. It may take some effort to distill a broad-based system down to that level, but it is important for the theme to be short and concise so you'll be able to recall it easily.

However you arrive at a theme, whether it's simply the name of the system or something more involved, pick a theme that's consistent with your reasons for starting a BBS. Make sure it's consistent with what you anticipate your users will expect from the system, and with what the system actually provides. Finally, remember when selecting your theme that the object is to provide a comfortable place for your callers to visit, no matter how simple or complex your actual application will be; your theme must be consistent with this concept as well.

Themes for Entrepreneurial and Hobbyist BBSs

Developing a theme for your BBS is critically important if you are an entrepreneurial or hobbyist sysop. A theme will guide your every decision, your every action with regard to your BBS. Once you pick a theme, you'll firmly entrench it in your mind.

Unlike themes for business BBSs, themes for the entrepreneurial or hobbyist BBSs are usually stated as a description of the system rather than the name of the system. Every decision that follows will be checked against the theme for consistency. Begin by simply stating the purpose of your BBS. If you have a BBS name in mind, let the theme flow from it. If you don't yet have a name, select one consistent with your stated theme.

For example, suppose you run a BBS named The Entertainment Line. Your theme might be, "The only BBS in Colorado that deals exclusively with every aspect of musical entertainment." You may want to post reviews about the latest CD releases, foster

discussion about musical artists, have your users vote on this year's Grammy nominations. All of these things are consistent with the stated theme.

It may be tempting, however, to add a section to your BBS that features online games. You've heard about this great game that runs with your BBS, and you've personally spent hours playing it on a system clear across the country. You'd like to buy a copy of the game and offer it on your BBS. After all, if you like it that much, surely your callers will enjoy it too. But review the theme again—"The only BBS in Colorado that deals exclusively with every aspect of musical entertainment." Is providing online games for your BBS users consistent with that theme? Probably not, unless the game happens to deal with musical entertainment in some form.

Nearly all business owners want to offer the widest possible selection of products and/or services to their customers, and BBS sysops are no exception. (Although they're not business owners, hobbyist sysops usually have the same temptation.) But the lure of being all things to all people leads you straight into the trap of being nothing to nobody. Resist—*strongly*—the desire to do it all. By spreading yourself and your system far too thinly, you'll likely end up offering a service that's a whole lot of average instead of a little bit of greatness.

Few BBSs are successful in providing an exceptionally broad range of services. Believing that you're going to start a mini-CompuServe is an overly lofty goal, and you're best off dropping that idea immediately. For the vast majority of BBSs, offering a small selection of things that are truly outstanding is the only way you will realize success in the operation of your hobbyist or entrepreneurial BBS. Your theme will help you keep this in mind as you proceed.

If you keep bumping into your theme as you progress, it's possible you didn't select an appropriate theme. Leave open the possibility that your theme isn't quite right. Try, however, to determine as early as possible in your project whether the theme is right or wrong.

This is important, because your theme will guide many important decisions. For example, if you'll be selling access to your

system, how will you price your offerings? If other BBSs within your market (whether your market is local or nationwide) have a similar theme, you must price your system competitively with those others BBSs. (If you don't, you'd better be prepared to offer something the others overlook.) However, if your BBS deals with horticulture, there's little sense comparing your subscription prices with those of a chat BBS across town—you have different services and different audiences.

The bottom line is to decide on a theme that defines your system and will set a course for it that you can live with.

Stating Your Theme

Regardless of why you're running a BBS (business, hobbyist, or entrepreneurial), once you've gotten a theme in mind it's important to state it. Some themes (especially for business BBSs) might become the actual name for your system. If that's the case, stating the theme is as simple as writing down the name of your BBS.

But if the name for your BBS and your theme are separate (as will be the case for most hobbyist and entrepreneurial systems) then the theme can become a great tag line for your BBS once it's up and running. Once your system is online, post the theme on your welcome screens so callers see it every time they log on. Include it in your marketing materials. Mention it when you speak to your users.

Before you get quite that far, you need to express your theme for your own benefit. It's best if you can state your theme as a sentence. Be creative, and don't be afraid to put some life into it. Here are some examples:

- The best horticulture BBS in the western United States.
- Georgia's most complete source of shareware and freeware software.
- The plastics technical information source.
- The self-service employee benefits online database.
- The comfortable neighborhood BBS where friends meet friends.

Although you may or may not immediately fulfill the lofty-sounding statement you make, remember that a theme is also your goal. You don't want to be deceptive about it—don't claim to be "the largest BBS covering such and such" when you're not—but it's important for your theme to inspire both you and your users and to set your system apart from its competition.

Once you state your theme, write it down. Look at it, remember it, think about it. If necessary, you can modify your theme later if you find that the one you picked is too limiting or overly broad, but remember to keep the theme in your mind at all times when making decisions about your system.

Many sysops find that writing down their theme and hanging it prominently near the BBS is helpful in remembering it and staying focused on it.

INSIDER TIP. . . Other Ways to Develop Your Theme

If you don't feel comfortable or able right now to develop and state your theme as I've outlined, don't feel obligated to take a step that might be too big for you at the moment. But you'll still want to develop a theme—even if you can't express it creatively or state it as a sentence right now.

If it's easier for you, think of your theme in the abstract sense; paint the big picture. First, set a goal for yourself. You can start by simply refining and polishing the reason you wanted to start a BBS in the first place. Do you want to start a BBS devoted to the subject of recycling? Then your goal can simply be getting such a system online. Once you've decided on the goal, refine it a bit. For example, do you want to be the best recycling BBS, the biggest, the friendliest? How would you meet that goal? What types of things would you put on the BBS that are consistent with that goal?

Once you've developed a goal and have a sense of excitement about it, then move it toward a theme by distilling your vision into a sentence. Write down your goals and your ideas for the system. Once you've written it down, begin distilling it by using fewer and fewer words to convey the same goals and ideals. Don't worry if you can't manage it all at once. Put it down, use what you have as a theme for the time being, then keep coming back to it periodically to do further refining. You'll find that eventually you can reduce the words to just a sentence or two that clearly and succinctly states your theme.

If at any time you get overwhelmed with the process, just put it down and come back to it in a day or two. But don't put it off! Remember its importance—every decision you make with regard to the BBS *must* be consistent with the theme, so make the development of your theme a top priority.

Deciding How the Work Gets Done

Once you've decided on your theme, you next need to figure out how to accomplish the work of further planning, installation and configuration, and operation. You've got a lot of work ahead of you, and you'll need to plan how that work is going to get done.

The first aspect of getting the work done is who is going to do it. As I stated previously, the vast majority of BBSs can be handled by just one person. Even if you're it, you'll still need to decide if you need any help, initially or later on.

The other aspect of getting the work done is deciding on a realistic time frame—a schedule of what's going to get done and when.

Business BBSs

If you're a businessperson planning a BBS for your existing business, you'll have to put some effort into deciding who will be doing the actual work. Again, go forward with the assumption that at least over the long term, only one person's part-time effort will be *required* for the job in the majority of cases. During the initial stages, however, it's likely that additional personnel will be involved if your company is large enough to have staff available for the project.

If you have several people to select from, your sysop should be someone with both the desire and the technical competence to run a BBS. Whether this is yourself or someone else, this combination is relatively important, although a strong desire can make up for insufficient technical expertise to some degree.

To many users, a BBS feels like a place to be, and the BBS sysop serves as host of that place. A disinterested host can ruin an otherwise nice-to-visit BBS and destroy the potential success and benefits of the system. Make sure that your sysop has the motivation to be a good host for your callers, or pick someone to run it who does. I've encountered many business BBSs where the

sysop is rude, aloof, or seemingly nonexistent, any of which can destroy the effectiveness of the BBS and give your company a bad image among callers to your system. Make sure the sysop (whether it's you or someone else) understands the importance of conveying a good attitude online, and the importance of doing the work of running the BBS, not just paying it lip service.

Many businesses underestimate the importance of a BBS. They figure (correctly, to some degree) that the BBS will be used by only a small portion of their customer base, and therefore, it doesn't have to be perfect—it just needs to get the job done. The correct mind-set, however, is to realize that even if the BBS is used by only a small percentage of your customers, those users *are* customers, and the BBS is as important in their minds as any other avenue of reaching your company. Making bad impressions anywhere, including online, doesn't serve your company well. Make sure that the company is committed to giving the BBS project what it needs to be successful and beneficial to the organization. Primarily, that takes the form of people who are committed to the project. Every BBS is a reflection of the person or people who run it; if they aren't committed, the BBS will show that by failing to fulfill expectations.

In business settings, it's critically important that more than one person have the knowledge of how the BBS is configured, how it operates, and what's involved. I've met dozens of hapless individuals over the years who've been stuck with a business BBS that someone else designed, configured, and operated. Now that the original sysop is long gone, the BBS has been dropped in the lap of some poor unsuspecting employee of the business. This person must then reverse-engineer the system design while trying to learn even the most basic elements of how to operate it (not an easy task). In the meantime, the BBS suffers—often technically, with features broken or unavailable—while users wonder what the problem is. It's easy to prevent this black eye for your company by making sure more than one person is on board with the project at some level.

Businesses may consider hiring a consultant to assist them with the project. If the staff is already heavily burdened, or if no one has enough time to learn what's necessary to set up a BBS, then a

consultant is a way for the business to buy its way out of the problem. As the BBS industry grows, more consultants are available. As with all types of consultants, investigate your choices thoroughly, get references, select a few that look good, and interview them as you would a potential new employee. Some BBS software companies can offer consulting services as well; once you've selected the software you'll use for the BBS, contact them.

Some consultants have biases about software choices you should be wary of. Although you may want a consultant to help you with the software selection, you should educate yourself about the choices available so you can make an informed decision yourself instead of depending solely on the consultant to tell you what's right. You'll learn more about BBS software in Chapter 3.

Whether you create the BBS on your own or not, high-level technologies such as gateways to existing systems may require the services of a consultant. Unless you have considerable technical talent in-house, be prepared to hire the services of an expert for extensions to basic BBS functionality.

Hobbyist BBSs

For the hobbyist, it's the work involved that makes the BBS hobby what it is: fun, exciting, and entertaining. Take your time, relish the challenge, and take as long as you want to get the job done. As you proceed, it's important to keep in mind that any new experience in life is new only once, and creating a BBS is no different. You'll look back at this with fond memories. Realize that the good old days are here now, and enjoy them for as long as you can.

I recommend that hobbyist sysops try to carefully plan the amount of time they work with the BBS. Like any hobby, especially a new one, creating a BBS can become all-consuming. Remember to put it down once in a while, as difficult as that might be, so you can catch your breath. You've got all the time in the world for this. It's going to be new only once, so don't use it all up in just a few days getting wrapped up in the buzz of it all.

If you have others in your household, you might consider getting them involved in your hobby. Running a BBS can become

somewhat demanding over time, and the rest of your family will not likely be too happy with your disappearing act. Possibly your spouse or children can take an active role in the BBS too, making it an enjoyable family experience. Young people especially enjoy BBSing; give them a learning opportunity they'll truly relish by letting them get in on the act.

Entrepreneurial BBSs

If you're an entrepreneur, chances are excellent you and you alone get to deal with the whole enchilada. From planning, to installation, to operation, it's your baby. If that prospect seems a little overwhelming, it should. That's not a reason to be scared; it's merely a reason to be paying close attention and to avoid rushing the project. One of the more common mistakes potential sysops make is taking things too lightly and hurrying them along with marginal results.

For an entrepreneur, doing the work is just the beginning. While you're designing the BBS and putting the pieces together, you'll also be getting a new business off the ground. You've got to think about business licenses, possibly liability insurance, taxes, making sure you don't go over budget, and a host of other concerns—all while you struggle to get the software running and set up the way you want it.

I highly recommend that entrepreneurs structure their time carefully. Make a list of things that need to get done. If you prefer, set yourself a schedule so you'll know what needs to be done when, and in what order. Use this book as a guide; once you're finished reading it, use its information to outline what needs to be done. Planning the BBS is important, as I've mentioned previously, and so is planning the planning. Make a list or schedule so you won't get buried by all of the things you need to think about.

If you're a poor time manager, consider getting some help. Read a time-management book (such as *Getting Things Done* by Edwin Bliss). Take an adult education course on time management at a community college. Remember that you're starting a *business* here, not just a BBS, and you'll need the time-management skills

to be successful in your endeavors. (If you're new to business, you may also benefit from other business-related books or classes.)

Most BBS entrepreneurs don't have infinite financial resources. If you are one of the few who does have some cash to spare, you might consider a consultant. As I mentioned in the preceding section on business BBSs, as the BBS industry grows, more consultants are offering BBS expertise. Be prepared—good consultants are hard to find (make sure you get referrals), and they aren't cheap. Make absolutely certain you've got the money available for a consultant before you consider one. If possible, contract with the consultant on a flat fee for the whole project (or whatever part of it you want the consultant to handle). Avoid open-ended hourly deals that have a strong tendency to go over budget, often by shocking amounts.

If you're not going it alone and have partners in your business, then now is the time to decide how you're going to distribute the work among yourselves. Again, planning the planning is what you're doing here, making sure that all parties involved know what falls into their domain, and when it needs to get done. Meet regularly to make sure the project is on target, on budget, and on schedule. Make sure all parties agree to the plan and the distribution of work so that you can avoid derailing the project later on with disagreements over the terms.

Understanding the Costs of a BBS

Before you get too far into your planning, you need to understand the real cost of a BBS. It's relatively simple to assess the cost of hardware, software, and telephone lines. But there are many hidden costs, too.

It's important to make sure you have enough money for all of the things you'll be called upon to pay for. This section is designed to help you assess the costs you're likely to face as you progress in the creation of your BBS. The total cost of a BBS can range from no cost at all to tens of thousands of dollars, depending on

your application, number of lines, what type of connectivity options you need or want, and what type of software you select.

This information holds for all types of BBSs—business, entrepreneurial, and hobbyist. How much money each item takes depends on whether your particular application needs the item at all, and if so, how much of it you need. Use this information as a rough planning guide in totaling up the real cost of your BBS.

Further details on all of these options are covered in the next few chapters. Refer to these chapters as you make your decisions on what your BBS needs:

Computer platform	Chapter 3
Other hardware	Chapter 5
BBS software	Chapter 3
Multitaskers	Chapter 3
Graphical interfaces	Chapter 3
Add-ons	Chapter 4
Telephone lines	Chapter 6
X.25 lines	Chapter 6

Hardware Costs

Hardware is one of the costs that's relatively easy to assess. You simply list the hardware you need, and shop around for the best source. A BBS requires more than just a computer and a modem, however. For more details on these choices, see Chapters 3 through 6. Make sure you've taken the following hardware costs into consideration as they apply:

- **Computer(s)** Depending on the software choice you make, you need one or more computers for the job. Don't make the decision of specific hardware to buy until you've selected the BBS software you need. BBS software choices are covered in Chapter 3. Prices are between $1,000 and $2,000 each (sometimes more) depending on the brand and level of power of the computer needed.
- **Hard disk(s)** Select the amount of hard disk space you think you'll need, then figure these costs into your plan. Many

BBSs in operation today run on as small as a 10Mb hard disk, but I recommend at least a 300Mb hard disk; more if your BBS will have a large amount of file downloads. Today, most successful, publicly accessible BBSs have hard disk capacities of at least 1 gigabyte. Prices range from $250 to over $1,500 each (occasionally more) depending on capacity.

- **Monitor(s)** You need a monitor for each computer so you can see what's going on. I recommend color monitors, but there's no reason to go top of the line for a BBS. The video card that drives your monitor (if applicable) need not be top of the line either. In most cases, you don't need or use graphics modes when running the BBS software. Prices range from under $100 (monochrome) to $300 each for a monitor adequate for BBS use.
- **Serial port hardware** Your BBS will need a way to connect the incoming callers. Since most BBSs use standard dial-up telephone lines and modems, you'll need serial ports to connect the modems. This often takes the form of multiport serial hardware, but it may also be an expansion chassis of some sort for your computer. You need a serial port for each incoming telephone line. The type of hardware specifically needed for this varies with the type of BBS software you choose. Prices range from $25 to nearly $2,000 (per card or chassis) depending on the number of ports needed and the type of interface required. Often, multiple cards or chassis are needed for high line counts; ask your BBS software vendor for assistance.
- **Modem(s)** Keep in mind that modems are the door to your BBS. You need one modem for each telephone line coming into your system. For PC-based BBSs, you may be able to use less expensive internal modems, but it depends on the BBS software you choose. Prices for high-speed, good-quality modems range from about $150 to over $500 each. Sysop discount programs are offered by many modem makers, and they are a good way to save money. See Chapter 5 for more information about these programs.
- **Printer(s)** Most BBSs don't use printers much, but you'll probably want at least one. Laser printers aren't needed except for special cases. Buy an inexpensive dot-matrix if you expect

you'll need one at all. Prices run from $150 to $300 each for a dot-matrix printer that's perfectly adequate for the average BBS.

- **Backup hardware** I *strongly* recommend you keep frequent, complete backups of your entire BBS. It's unworkable to back up to anything but a tape system unless you're running a hobbyist BBS and have the time to back up to diskettes periodically. Excellent-quality, high-capacity tape backup systems are widely available. Prices range from about $150 to $1,000 each depending on capacity, capability, and interface method.
- **Uninterruptible power supply (UPS)** Business and entrepreneurial BBSs will absolutely want to consider a UPS. A UPS keeps your system operational for a short period in case of power loss. Since most power losses are short term (usually under a minute), you don't need a large-capacity UPS unless you want to keep the system running during longer-term power outages. UPSs also protect your system from brownouts (brief reductions in power level) and spikes (brief increases in power level). UPSs are generally rated by the amount of time they'll keep *x* load running (the load usually represented in watts). Keep in mind that all your computer equipment and modems need to be powered by the UPS, and it represents a fairly substantial load. To keep the average BBS online for a few minutes maximum, plan on spending between $300 and $500. To keep the average BBS online for an extended period, or a large BBS online for a short time, plan on spending $500 to $2,500 (and sometimes more) depending on the capacity of the UPS. Power generators may be an option for prolonged power outages, but sophisticated automatic generators of adequate capacity are usually beyond the reach of the BBS sysop.
- **X.25 network interface(s)** If your BBS will be using X.25 interconnection (see Chapter 6 for details), then you'll need special hardware for the job. This hardware will replace modems on any lines that will be coming through the X.25 circuit. Usually this piece of equipment is a packet assembler-disassembler (PAD), but it can sometimes be a special card that plugs into the computer. Prices range from $1,500 to $2,500 each for interface cards, and from $1,500 to over $10,000 each for PADs, depending on the number of ports needed.

- **Local area network adapters** If you select BBS software that requires you to have a local area network (LAN), then you may need LAN adapters, such as Ethernet cards, for each computer on the LAN. (Some computers have built-in networking capabilities.) Some types of LANs may require additional hardware devices, such as concentrators, in addition to the adapters. Whether you need a LAN, and if you do specifically what type you need, varies with the BBS software you select. Prices range from under $100 to $400 each depending on interface method and brand.
- **Asynchronous server(s)** If you'll be running your BBS in a LAN environment, and you want LAN users to be able to log onto the BBS via the LAN, then you may need an asynchronous server, depending on the type of BBS software you choose. (Many BBS packages now offer direct logon support for LAN environments without the need for an asynchronous server.) An asynchronous server is a combination of hardware and special software. Prices range from cheap to astronomical—plan about $2,500 each, but investigate what your particular LAN requires or can support.
- **Terminal or Internet Protocol (IP) server(s)** If you'll be allowing access to your BBS via TCP/IP login (such as a telnet session via Internet) then you may need a special communications server, depending on the type of BBS software you've selected. A terminal or IP server will be used in lieu of modems on the affected lines. Prices range in the thousands of dollars each, with prices starting at around $2,000.

Software Costs

If you'll be running a BBS, you will (of course) need BBS software. But that's not necessarily your only software expense. Depending on the type of software you select and your particular application, you might find yourself in the market for software products you might not expect. For more details about these choices, see Chapters 3 through 5. Here is a checklist of software purchases:

- **BBS software** This forms the base of your system, and it is the one software selection every potential sysop has to make.

Prices are from $0 (free) to $2,500 (sometimes more), depending on the type of software you select, the line count it supports, and the platform it runs on.

- **Manufacturer BBS add-ons** Commercial BBS software vendors usually offer an array of add-on options for their software. Add-ons include internetworking support, sysop maintenance options, off-line reader modules, online ordering systems, chat enhancements, database systems, and more. Prices range from $50 to $2,500 per package, depending on what the add-on does and how it's integrated.
- **Third-party BBS add-ons** For most BBS software, these add-ons take the form of *door applications* that your BBS software will shell to. For other packages, these take the form of integral modules. Examples of such software include off-line reader modules, callback verifiers, online game applications, document search and retrieval, ordering systems, and user maintenance and billing systems. Prices range from $0 (free) to $1,000 depending on the software distribution method (many door applications, for example, are freeware or shareware), what the product does, and how it's integrated.
- **LAN software** If your BBS software requires a LAN, or if you want to add one to your system for some other reason, you need the network operating system (NOS) software. Typically, you need one license per computer you'll connect to the LAN. Prices range from $100 per computer (node) to $5,000 (or more) for packages that include licenses for several computers.
- **Multitasking software** If your BBS software requires it, you may need multitasking software such as DESQview or Windows. If your BBS software requires multiple PCs, you'll need a separate copy of the multitasker for each PC that uses the software. Prices range from $50 to $200 per package.
- **Multiuser operating system software** If your BBS software requires it, you may need a multitasking operating system such as UNIX (or a UNIX clone) or OS/2. Prices range from $75 to $1,000 (often more) depending on the specific operating system needed.
- **Memory management software** Some DOS-based BBS packages require a memory manager to provide memory

services, such as XMS or EMS. Later versions of MS-DOS (5.0 and up) are supplied with this software, but I recommend more powerful software such as QEMM or 386Max. Prices are usually under $100.

- **Communications driver software** Some BBS software may require an external communications driver, often supplied separately. The most common type of driver is the FOSSIL, used by some PC-based BBS packages. Communications drivers or modules may also be needed for connectivity options such as X.25 or LAN-based logons. Prices range from $0 (free, for some FOSSILs) to $1,500 depending on the exact function provided.
- **Backup software** You need reliable, quality backup software to perform routine system backups. Although hardware devices such as tape drives may come supplied with basic software, it's best to use a full-function package available separately. Prices range from $50 to $250, sometimes more, per package.
- **Disk-caching software** Many BBSs perform better with disk-caching software. Some operating systems come equipped with such software, but it's usually best to select a full-function third-party package if you choose to use a disk cache. Consult your BBS software vendor for advice on disk caching. Prices range from $50 to $150 per package.

Interconnection Costs

In most cases, connections into your system take the form of normal, everyday telephone lines that you order from your local telephone company. Depending on the type of BBS you'll be running, you may have other costs as well. Chapter 6 covers these options in more detail. Here is a list of things to consider:

- **Local telephone service** You need a telephone line for each incoming line you'll be installing. In the majority of cases, these are regular telephone lines just like you have in your home or business. Prices range from $10 to $50 per month per line (plus installation), depending on where you are located, what dialing plan you select, and whether you will be paying business or residential rates.

- **Long-distance service** Most BBSs have incoming calls only, and you do not have to worry about long-distance charges. Some BBS software, however, can provide outbound gateway services. Also, if you add internetworking to your BBS, such as FidoNet or Internet e-mail, then you'll likely need to place calls, often over long distance. If you anticipate placing long-distance calls, estimate the monthly cost based on prices from about $.08 to $.50 per minute of long-distance calling (more for international calls), depending on the long-distance company you use, your dialing plan, and the distance of the call.
- **Dedicated leased lines** Sophisticated connectivity, such as Internet telnet logins, may require the use of expensive dedicated lines between your BBS and your service host. These may be 56kbps, T-1 or T-3 lines in most cases. Installation is usually quite expensive, as are monthly fees, which depend on the speed and distance of the connection. Count on paying several hundred dollars a month for this type of service.
- **800 service** If you'll be making your BBS accessible by an 800 number, you'll be responsible for paying the bill. Most 800 services can be had for $15 to $25 per month, plus $.10 to $.30 per minute of connect time, depending on time of day and call distance.
- **X.25 network services** If you'll be making your BBS available by an X.25 public data network, you'll be responsible for the bill. Most X.25 services cost in the range of $750 to $5,000 per month, depending on the carrier you use and the billing plan you select, plus $1.50 to $15 per hour of connect time, depending on time of day, the data rate in use, and the X.25 vendor you choose.
- **E-mail gateway and/or networking services** If you'll be offering Internet e-mail or logon support, or some other type of commercial gateway or connection service, then you'll generally be required to pay for it. Simple UUCP accounts for Internet e-mail start at $20 a month and $2 per hour of connect time and go up nominal amounts from there. Direct networking support, such as a TCP/IP or SLIP connection to your BBS, can run up to $1,000 or more.

Miscellaneous Costs

For most BBSs, hardware, software, and interconnection costs are the extent of the costs involved in running a system. But depending on the type of system you're running and your personal needs or wants, there may be other costs as well. The following list will help get you started in recognizing and assessing these costs:

- **Financial costs** If you're accustomed to making money from your bank accounts and enjoying free checking, when you run a business it's a different matter. In most cases, you'll pay for every item processed through your checking account (deposited items and the checks you write). You'll also pay to process credit-card transactions. Credit-card processing involves up-front costs, which can vary from as little as $25 to as much as $500 or more. Ongoing monthly costs consist of the various service charges you'll receive from your bank and/or credit-card processor.
- **Rent** Entrepreneurial sysops may need or want to run their BBS from a rented office, especially if zoning considerations restrict the operation of a business in the home. Most BBSs don't need a lot of space. A few hundred dollars a month will yield a comfortable space to operate from at today's rates in many areas. (Real estate trends have a tremendous impact on rent; in some areas during boom periods, it may be unrealistic to rent office space for your BBS.)
- **Insurance** Hobbyist sysops likely have adequate coverage from their renter's or homeowner's insurance, but check with your insurance agent to make sure. You need to determine whether you have adequate liability insurance, as well as adequate coverage of your computer equipment. You may want to get additional insurance coverage for your equipment in the form of a rider for your main policy, a separate property policy, or special computer equipment insurance. Entrepreneurial sysops should consult an insurance agent for a business insurance policy. Business sysops are likely already covered; check with your insurance agent. Adequate coverage for most hobbyist or entrepreneurial BBSs can be had for as little as $25 per month; good business insurance coverage can run considerably more.

- **Electricity** Computer equipment takes power to run. Operating most BBS systems won't boost your electricity bill by any noticeable amount. However, if you run multinode software and have numerous computers running your BBS, then the impact can be quite dramatic. In extreme circumstances, upgraded electrical service may even be needed to handle the extra ampere load. I've even heard of situations where there are so many computers running a multinode BBS that air conditioning is required, even in winter months. Consult your utility company for current rate information and for advice on how to determine the cost of running your equipment. Most utility companies have this information and are quite helpful in providing it to their customers.
- **Furniture** You need something to set your equipment on, a desk to use for administrative tasks, a chair to sit on, and so on. You may already have all the items you need; otherwise, you need to obtain them. For those on a budget, used office furnishing stores exist in virtually all major cities and are a great source of good-quality equipment at reasonable prices. Determine what you need, and shop around carefully.
- **Office supplies** Even hobbyist sysops will likely need at least some office supplies. Pens, stapler and staples, paper, paper clips, tape, paper for your printer, postage, and diskettes head the list. If you don't have these items already, determine what items you'll need and acquire them. Such costs represent an ongoing expense.
- **Human resources** In a business setting or in some entrepreneurial settings, you may have staffing costs to consider. If employees apply to your situation, consider the cost of payroll, worker's compensation insurance, taxes, and so on. Exact costs vary, of course, by the number of employees and how much you pay them.
- **Ongoing education** Any BBS sysop will likely want and need to keep up to date. Make sure you set aside a small amount of money for subscriptions to trade journals such as *Boardwatch Magazine*, and for books on business or computer topics. If you're an entrepreneurial or business sysop and you choose to take adult education or college courses on business, make

sure you take these costs into consideration as well. Trips to conferences such as the annual ONE BBSCON, the BBS industry trade show, may also be something you'll want to consider and of course will need to pay for. The exact cost varies based on your needs and ability to justify the expense.

- **Marketing** In business and entrepreneurial situations, you need to set aside some amount of money for marketing your system. In a business setting, this may be covered in other ways by your company, such as simply including the BBS number in all your company's advertising. Entrepreneurs need to finance a marketing campaign, if only a small one, for the BBS, covering advertising, direct mail, or whatever other marketing avenues you explore. The exact cost of marketing varies radically, but it should be a consistent percentage of your system's income; this allows your marketing to grow with your business.
- **Maintenance contracts** You may desire to have ongoing service or maintenance contracts on your computer equipment for faster repair in the event of equipment failure. Some BBS software companies may also require you to pay for service or support on their products. Make sure you determine whether these costs apply, and if so, how much they will cost you. These costs may be one-time only, or they may be ongoing; repeating costs are generally charged on an annual basis, so budget accordingly.

Summarizing the Cost of a BBS

After going through the preceding sections, you've probably learned about at least a couple of items you need to pay for but hadn't thought of before. For most people, it's easy to miss some of these costs and end up being undercapitalized. No matter what type of BBS you run, there's nothing quite like the feeling that you've come all this way, only to find out that you need deeper pockets to finish the job. The BBS software, a computer to run it on, and a telephone line make up the basics of any bulletin board, but that's just the beginning. Take time to analyze the real cost of *your* BBS before you're in too deep. Table 2-1 gives a sample first-year cost analysis for an eight-line PC-based bulletin board.

Table 2-1
Sample Cost Analysis of Creating a BBS and Running It for One Year

		Number	Per Item	Total
Hardware	Computer	1	$1,500.00	$1,500.00
	Large Hard Disk	1	$1,000.00	$1,000.00
	Monitor	1	$250.00	$250.00
	Multiport Card (8-Port)	1	$625.00	$625.00
	Modems	8	$179.00	$1,432.00
	Printer	1	$200.00	$200.00
	Tape Backup	1	$250.00	$250.00
	TOTAL HARDWARE			$5,257.00
Software	BBS 16-Line	1	$895.00	$895.00
	BBS Add-On	1	$99.95	$99.95
	BBS Add-On	1	$149.00	$149.00
	Third-Party Game	1	$169.95	$169.95
	TOTAL SOFTWARE			$1,313.90
Interconnection	Installation	8	$75.00	$600.00
	One Year of Service ($30/mo/line)	8	$360.00	$2,880.00
	TOTAL INTERCONNECTION			$3,480.00
Miscellaneous	Electrical—One Year of Service			$600.00
	Desk	1	$350.00	$350.00
	Chair	1	$150.00	$150.00
	Office Supplies for One Year			$600.00
	Trip to One BBSCON			$1,100.00
	Insurance			$500.00
	TOTAL MISCELLANEOUS			$3,300.00
	GRAND TOTAL			$13,350.90

Anticipating Future Growth

Chances are, your BBS is going to grow once you're online—provided that the word gets out to the right people in the right places. (Marketing your BBS is the focus of Chapter 9.) This presents a problem, however: anticipating growth. If you don't plan for growth, you'll end up being caught off guard, and depending on the decisions you made along the way, you may end up being stuck with some difficult decisions.

Hobbyist BBSs

If you're a hobbyist sysop, you have an important decision to make before you proceed in your planning and development: Do you want growth?

A hobbyist BBS can be a fun and enriching experience. But what happens if your BBS really takes off? Chances are a phone line or two isn't going to handle the load any longer. Will you expand? Can you afford to expand? Do you even want to? This is the point at which many hobbyist sysops make the transformation to being an entrepreneurial sysop in order to afford and to justify the expansion of their systems.

Many people don't want to be (or would be better off not being) a businessperson. If you're not interested or don't have what it takes to operate a business, you'll have to decide that a hobbyist BBS is enough for you. Along with that comes defining your limits: How much are you willing to spend on the BBS? For some people, it's difficult enough justifying the expense of a single-line BBS. I've seen others who run multiline systems with half a dozen or more lines and pay for it out of their own pockets. Whatever you can afford, don't let the unique allure of being a sysop lead you to overextend yourself. Once you've defined your limit, don't exceed it.

In summary, anticipating growth for the hobbyist sysop revolves around defining your financial limits. When system growth begins to exert pressure on those limits, you'll have to decide whether being an entrepreneurial sysop is right for you.

Business BBSs

For most businesses, starting and operating a BBS is a relatively modest expense. However, as a BBS grows, so does the cost to operate it. If you're a business BBS sysop, you may find yourself in the position of having to contain costs, both at the beginning and later as your system grows.

It may be more reasonable in some situations to plan for growth from the beginning and overimplement your system, equipping it with more hardware and software capability than you might initially put online. If budgeting systems or purchasing procedures make incremental purchases later on more difficult than simply buying big initially, this might be best for you. The extra capacity can then be ready when you need to expand to meet increasing demand for your system. The only new expenditure you'll have to make is additional telephone-line capacity.

If your business situation is such that purchases can be made later on with ease, then wait for the need for expansion to surface, and handle the situation when it arises.

However your situation dictates that expansion should be addressed, be prepared for increasing demand for your service over time. As I've mentioned previously, one mistake common in business BBS environments is that management doesn't take the system seriously enough. If your system grows to the point where you need additional capacity, and the powers that be are not prepared to finance the necessary additions, then the BBS is doomed to fail. A BBS cannot be successful, cannot meet its goals, and cannot reflect positively on your business if it is not properly looked after, and that includes accommodation for growth.

Expansion when the need arises is just one form of proper upkeep that, if not performed, reflects poorly on your company. The key is for management to be fully behind the BBS from the

beginning, so that when the time comes to expand, there won't be any question of whether it should be done.

Depending on your situation, you may wish to analyze your costs (as directed previously in this chapter), and attempt to make some basic projections for system growth. Some (if not most) of these numbers cannot be accurately calculated until you select your software, but once you've arrived at some figures, add the BBS and its growth to your company's budget. That way, the BBS will have funds available on an ongoing basis to finance additions and expansion.

However expansion is handled, whether you choose to include the BBS in the company's budget or not, the bottom line is to make sure that the company is committed to the BBS project now and in the future. This commitment is the only way your system will be successful. A lax attitude toward the system on the part of management will doom the BBS to failure; it's best to forgo the BBS entirely than to start one and not be willing or able to carry it through.

Entrepreneurial BBSs

One of the biggest challenges you'll face as an entrepreneurial sysop is estimating and addressing expansion needs. Any new business, including the operation of a BBS, is full of unknowns. Is there a market for your business? Will your marketing successfully reach that market? If it does, will your system provide what the market is willing to pay for? Those are the major areas of concern, and all are unknowns. Only by opening and operating your business will you find the answers.

With all of those unknowns, how do you estimate your growth and plan for it accordingly? The answer, unfortunately, is that you really don't. Part of being a successful entrepreneur is going with the flow and taking things as they come. A BBS probably has more unknowns than the average business, since the technology is relatively young, and operating a BBS as a business is a fairly new concept. As time goes along, better ways to come up with these answers may emerge. For now, it's purely guesswork on your part.

My advice to the entrepreneurial sysop is to set aside at least a small amount of money for the expansion of your system in the future. Remember that the cost of expansion consists of software upgrades, hardware upgrades, and/or additional telephone lines. If there are set breakpoints for software and hardware upgrades with the BBS software you choose, know where they are and know when you'll have to pay for them. Software breakpoints are usually the increments of line capacity the software is available in (such as 2-line, 8-line, 14-line, and so on). Hardware breakpoints might be the port capacity of a serial card (such as 4-port, 8-port, and 16-port).

If you have the money when you start out, you may also wish to jump to the next increment of hardware or software upgrades immediately. For example, if your BBS software comes in 2-line and 16-line versions, you may wish to go ahead and buy the 16-line version now, even though you may only need 2 lines' worth of capacity initially. That way, you'll be prepared and won't need to come up with additional money later. Hardware usually increments in much the same manner; talk with your BBS software vendor to know what the next increments are, and if possible, buy up now.

For the entrepreneurial sysop, anticipating growth relies totally on guesswork. Set aside some money in the beginning if you can to finance future expansion. Or, buy an increment of software and hardware greater than you need initially, and you'll be prepared for some expansion without getting hit with additional cost when the time comes. When thinking about these issues, bear in mind that an entrepreneurial BBS, almost without exception, is a slow burn—success comes steadily and slowly, not all in one burst. You'll generally have quite a bit of warning when it's time to upgrade.

Summary

After reading this chapter, you should have an understanding of the following:

- Plan how to integrate a BBS into your life. A BBS takes time, in the form of user maintenance, file maintenance, message maintenance, general system maintenance, and management functions. A BBS requires space, sometimes lots of it. Users look to you for guidance and technical support, and this too entails a burden on you and your time.
- Developing a theme is critical to your success.
- The businessperson should know who is going to run the system, and whether more than one person (or a consultant) is needed. The entrepreneur should understand there's a lot of work to do, and he or she either is solely responsible for the effort, or else needs to decide what work will be assigned to partners or consultants. Hobbyists must not allow their BBS project to become all-consuming—just take it easy, and enjoy the experience.
- Know what hardware, software, interconnection, and miscellaneous costs are involved.
- Know how you intend to deal with future expansion needs.

Worksheet 2: Planning Your BBS

Estimate the average amount of time you plan to spend each week on each of the following tasks. Total the value to arrive at the estimated weekly time investment you plan to make once the BBS is online.

User maintenance	_____ Hours	(1–2 hours average)
File maintenance	_____ Hours	(1 hour average)
Message maintenance	_____ Hours	(2–6 hours average)
General system maintenance	_____ Hours	(1–2 hours average)
Management functions	_____ Hours	(2 hours average)
TOTAL BBS ACTIVITIES	_____ Hours per week	

Describe where you intend to place your BBS system.

Location _____

_____

Are there telephone hookups nearby (or can they be easily installed)? ❑ Yes ❑ No

Should the need arise, where can you expand your BBS? _____

Describe how you intend to address the issue of user support.

- ❑ Make personal phone number unpublished
- ❑ Make personal phone number available

- ❑ Offer voice support
- ❑ Publicize voice support number

- ❑ Provide special message area for problem reports and assistance
- ❑ Make "sysop chat" function available for user assistance

Other _____

What do you plan to name your BBS?

Name _____

State the theme of your BBS.

Theme _____

_____

If not you, identify the people who will be responsible for the ongoing operation of your BBS. Make sure the person or people you list are suitable hosts who will give the system and its users due attention.

Hosts _____

_____

Estimate your total hardware investment. Revise these estimates as you progress through the rest of the book and narrow down specifics.

Computer(s)	Quantity _____	@ _____	= _____
Hard disk(s)	Quantity _____	@ _____	= _____
Monitor(s)	Quantity _____	@ _____	= _____
Serial port hardware	Quantity _____	@ _____	= _____
Modem(s)	Quantity _____	@ _____	= _____
Printer(s)	Quantity _____	@ _____	= _____
Backup hardware	Quantity _____	@ _____	= _____
UPS	Quantity _____	@ _____	= _____
X.25 interface(s)	Quantity _____	@ _____	= _____
LAN adapter(s)	Quantity _____	@ _____	= _____
Asynch. server(s)	Quantity _____	@ _____	= _____
Terminal server(s)	Quantity _____	@ _____	= _____
ESTIMATED TOTAL HARDWARE INVESTMENT			= _____

Estimate your total software investment. Revise these estimates as you progress through the rest of the book and narrow down specifics.

BBS software	Quantity _____	@ _____	= _____
Manuf. add-on(s)	Quantity _____	@ _____	= _____
3rd party add-on(s)	Quantity _____	@ _____	= _____
LAN software	Quantity _____	@ _____	= _____
Multitasker(s)	Quantity _____	@ _____	= _____
Multiuser OS	Quantity _____	@ _____	= _____

Memory mgr(s).	Quantity _____	@	_____	= _____
Comm. driver(s)	Quantity _____	@	_____	= _____
Backup software	Quantity _____	@	_____	= _____
Disk cache(s)	Quantity _____	@	_____	= _____
ESTIMATED TOTAL SOFTWARE INVESTMENT				= _____

Besides your hardware and software investments, estimate any additional one-time costs:

Telephone installation	= _____
Rent deposits	= _____
Electrical installation	= _____
Credit-card processing setup	= _____
Other	= _____
OTHER ONE-TIME COSTS	= _____

Estimate your total interconnection costs. Revise these estimates as you progress through the rest of the book and narrow down specifics. These values should be *monthly* costs.

Local phone service	Quantity _____	@	_____	= _____
Long-distance service	Quantity _____	@	_____	= _____
Leased line(s)	Quantity _____	@	_____	= _____
800 service	Quantity _____	@	_____	= _____
X.25 network service	Quantity _____	@	_____	= _____
E-mail gateway	Quantity _____	@	_____	= _____
ESTIMATED TOTAL INTERCONNECTION COSTS (MONTHLY)				= _____

Besides your interconnection and miscellaneous monthly costs, estimate any additional monthly costs:

Travel expenses	= _____
Water	= _____
Gas	= _____
Other	= _____
OTHER MONTHLY COSTS	= _____

Estimate your total miscellaneous costs. Revise these estimates as you progress through the rest of the book and narrow down specifics. These values should be *monthly* costs.

Financial	= _____
Rent	= _____
Insurance	= _____
Electricity	= _____
Furniture	= _____
Office supplies	= _____
Human resources	= _____
Ongoing education	= _____
Marketing	= _____
Maintenance contracts	= _____
ESTIMATED TOTAL MISCELLANEOUS COSTS (MONTHLY)	= _____

Now total all of these costs:

Estimated one-time costs to get your BBS started:

Hardware investment	_____
Software investment	_____
Other one-time costs	_____
TOTAL UP-FRONT COST	_____

Estimated monthly costs to keep your BBS rolling:

Interconnection costs	_____	per month
Miscellaneous costs	_____	per month
Other monthly costs	_____	per month
TOTAL MONTHLY COST	_____	

In what ways do you intend to cope with the prospect of future growth?

- ❑ Buy more hardware/software initially
- ❑ Place funds to finance growth in budget
- ❑ Wait for the need to arise and handle it then
- ❑ Base growth possibility on system success and/or income
- ❑ Other _____

3 Choosing Basic Hardware and Software

After you've decided you want a BBS, and after you've spent some time researching what's involved in setting one up, it's time to start analyzing the choices available to you.

It's no small task, either. The choices include how many lines you need, what type of computer you wish to run your BBS on, and much more. You need to understand the differences between multinode and integrated BBS software, and which type makes the most sense to you. Some BBSs require separate multitasking software. You may wish to explore graphical technologies as well.

This chapter is devoted to helping you assess the basic hardware and software choices available to you, and to make wise, informed choices.

Single Line or Multiline?

One of the first choices you need to make is whether you'll be operating a BBS with just one telephone line, or a system with multiple lines. Multiple lines are required if you want more than one person to access your system at the same time.

This is an important decision primarily because it affects the type of software you'll run on your system. In the past, people usually started an inexpensive single-line BBS system and expanded later to multiline capability. For some, this is still a viable choice, but some BBS software is no longer offered in a single-line version, making it no more cost-effective from the software standpoint to start with only one line. To further complicate matters, if you

start with a single-line system and expect to expand later, it may not be as easy as you think.

For many years, single-line BBS software was the only type available. In mid-1980s, multiline BBS software began to appear, which allowed multiple users to be logged onto and using the system at the same time. For the first time, this capability allowed BBSs to service large user bases.

Today, multiline BBSs are virtually a requirement for any successful BBS. Certainly entrepreneurial and business BBSs cannot meet even the most basic of goals, let alone prosper, without having multiline access (even if it's just a couple of lines). Hobbyist BBSs are the only type of BBS that should consider single-line operation. This is yet another area, however, where the decision is based on affordability. If you're a hobbyist sysop and can afford only one line, then have only one. If you want and can afford more, get more. In most cases, however, it's simply unworkable to finance even a small multiline system out of your own pocket.

Most entrepreneurial and business sysops find that BBS line counts are expanding rapidly over time. Just a few years ago, an 8-line BBS was considered quite large. Today, an 8-line BBS makes a good starting point, but it is considered small for a system that's been online any reasonable length of time.

One of the important considerations for a BBS sysop is to make sure that your BBS system is expandable. Success with a BBS generally means adding more lines over time (unless you're a hobbyist); make certain you've selected BBS software that can grow with you, and that the cost for that expansion is reasonable.

Calculating the Number of Lines You Need

Once you make a decision to go multiline, one of the most frequent questions potential sysops have is how many lines they need for their system. The line count is really a deeper issue, because the number of lines you're able to run will be affected by the software choices you make.

Most hobbyist BBSs are operated on just one or two telephone lines. If you're a hobbyist sysop and have the money to spend, you may want more lines—but make sure you understand the *total* costs involved before you contemplate adding them. Most sysops, however, find it difficult to justify the expense of more than a line or two unless the system is carrying itself—in other words, you make the transition from a hobbyist system to an entrepreneurial system (which is a fairly common transition to make).

If you are an entrepreneurial sysop, you need to make sure you have the lines available to serve your customers when they want to call you. You have to balance that against the amount of capital you have to devote to telephone-line costs.

Business sysops need enough lines to service their callers, too. For most companies that commit to a BBS, it's generally not a problem to start out with a little more aggressive line count than other sysops are able to afford.

This section provides some processes by which you can arrive at a line count you're comfortable with to get your system started.

The Staged Approach

Many sysops find it best to stage the line count for their systems by starting out very small initially, maybe a line or two, and then adding more lines as needed.

Using the staged approach, you simply begin with a line count you deem adequate. Through close monitoring of system usage, you increase or decrease the line count when the need arises.

Most commercial BBS packages allow you to scale up in line count without too much difficulty. The cost, however, can be another issue. Sometimes increasing line count means software upgrades, additional and/or more powerful computer equipment, additional serial port hardware, and of course additional modems.

It's best to ask your BBS software vendor about these issues in advance, possibly before you even make the final selection of your BBS software. Make sure you find out how easy it is to expand your line count and how much it costs. Some BBS software

starts out inexpensive, and you may be tempted to pick a product because of its low initial cost. But make sure you look at the costs for the system you want to grow into; often, the BBS software that is the least expensive initially turns out to be the most expensive in the long run.

Regardless of what software you select, know and understand the line counts at which large outlays of cash must be made to upgrade your line count, and plan your growth to have the funds available when the time comes.

A staged approach to line count allows you to open the system, test the results, then react. Its advantage is a lower up-front cost; the disadvantage is that you might not be able to respond quickly enough (financially or otherwise) to keep up with your growth if the system takes off.

The Estimated Approach

Another approach to determining an initial line count is to estimate what your needs are. For potential sysops who have no personal experience with BBSs, this is probably not the approach to select. It's based on educated guesses of expected system usage, and unless you have some background in bulletin boards or have researched the subject thoroughly with existing sysops, you probably won't estimate your needs accurately. Even if you have experience or have done the research and asked the questions, this approach is error-prone, and you are advised to proceed with caution.

The estimated approach begins by analyzing three variables:

- The number of minutes you expect your callers to stay online per call on average.
- The number of callers you need to service on a daily basis on average.
- The number of hours per day that your system will typically be used.

These three variables are used in a formula. This approach is inherently inaccurate because all the variables used in the formula

are guesses you're going to make based on a total absence of real data. Any mistake you make in guessing one of the variables will throw off the result exponentially, so don't insert random values you think sound right; take the time to make at least an educated guess rather than one off the top of your head.

The average number of minutes per call is just that—an average. Taking into account the modem speed at which your callers are likely to connect to your system, analyze what your callers will do once they're online. How long will it take to get these things done? Keep in mind that systems offering chat facilities or online games have a tendency to keep callers online longer (often 30 to 60 minutes per call), while data-gathering BBSs run by a business may have call lengths of just a minute or two each.

The number of callers you need to serve on a daily basis is also an average. Remember that except in some special situations, your users will not call on a daily basis. If you have 700 people who need to dial your system once a week, that's an average of only 100 per day (if you count weekends). Make sure you calculate this number based on that fact (that not everyone is going to call every day) to avoid grossly overestimating the number of people who'll be calling. This number is especially difficult to arrive at, because often many of your callers call daily, spending as much time as possible online, while others consider a two-minute call once a month excessive. Do the best you can at finding the middle ground.

The number of hours per day that your system will be used is a value based on what you feel is realistic. Even though a BBS can be open 24 hours a day, a period of peak usage occurs in virtually every case I've seen. For example, if you appeal to local business callers only, then the 9:00 A.M. to 5:00 P.M. slot will be your peak time, a total of just 8 hours. If you appeal to business callers across the United States, then 9:00 A.M. Eastern to 5:00 P.M. Pacific, or 11 hours total, will represent your typical availability period. Systems that appeal to the general public will be used primarily between 5:00 P.M. and midnight local time, 7 hours total. Use these figures as a basis to determine your typical daily usage value.

Once you have these values, use them in the following formula:

$$\text{Lines} = \frac{(\text{Minutes per Call} \div 60) \times \text{Number of Callers}}{\text{Hours per Day}}$$

The result of this calculation will yield a rough estimate of the number of lines you'll need to service your load.

In my experience, the result of this formula should be divided by 2 before it's used. This compensates for a natural tendency to overestimate the values that go into the calculation. If you feel the variables you've used are well-founded, then go with the result directly. Otherwise, get your result and reduce it 25 percent to 50 percent before you proceed, and make sure you're ready to expand or contract the line count if needed should your estimates be off.

INSIDER TIP. . . Understanding Peak Load

It's important to understand that your ultimate line count will be decided only after the system is running, and after you've established *peak load*—the demand for your system during peak hours.

On a typical public system, the type run by hobbyists and entrepreneurs, your call volume will be much higher during the evening than at any other time of day. Many popular such systems have difficulty filling even a line or two during the day, but handily fill up 18 lines every evening. It's a somewhat natural tendency to look at all those modems and telephone lines during the day and wonder, "Why did I order all this?" The answer comes at night, when paying customers are ready to give you their money—and fill up all your lines in the process.

The staged approach is best when you want to make line-count adjustments once you're online. If the system seems too heavily loaded during peak hours (all lines stay busy for lengthy periods), then add one or two more lines. If the condition hasn't corrected itself, add one or two more. Keep adding lines until you reach the point where all are busy only for short periods during your peak hours. Remember that customers aren't going to pay if they can't use your system when they want. That doesn't mean you must have open lines at all hours of the day, but that the period of time that all are busy should not be excessive.

Most BBS software has reporting capabilities, either included with the software or available from third-party vendors. The number to look at is the *all lines busy* value, if your reporting software provides the figure. It is the amount of time all of your lines were filled—all busy—preferably averaged out over at least a 2- to 8-week period. It is either a percentage or a number of minutes. Percentage values, which are a percentage of the *total time the system was running*, are not meaningful since they don't take into consideration the actual time ranges that people use your system. You need to calculate the figure on your own.

For example, let's say your report shows that the system was all busy for a total of 60 minutes (1 hour) on average per day. If your system is normally used from 5:00 P.M. to midnight daily (7 hours), that means for 1 hour out of the 7 hours your users primarily dial in each day, callers are getting busy signals, or approximately 14 percent of the time (1 divided by 7). Expressed another way, that's an average of 1 caller in 7 that didn't get through, and (if you charge a fee) it represents 1 caller in 7 who cannot spend money with you. This figure should be kept to 5 percent (about 1 call in 20 gets a busy signal), or preferably even less if you can afford it. The ideal case is no busy signals at all, but this is usually a bit unrealistic, not to mention largely unnecessary.

Choosing a Computer Platform

Before you can select software for your BBS, you must first select a computer platform upon which you will build your system. As with all the decisions you'll be making regarding your BBS, you have several choices. Which one you pick depends on your application and upon personal preference.

The PC Platform

By far the most popular choice for a BBS is the PC platform. The PC platform consists of DOS-based, Microsoft Windows-based, and OS/2-based BBS applications operating on IBM PCs or compatibles.

Of the various PC platforms, DOS-based BBS software represents the largest single segment of any of the various types of bulletin boards operating today; more DOS-based BBSs are in operation than any other kind. Probably the best reason to run a BBS under DOS on a PC is that the BBS software in this segment is mature, offering state-of-the-art features, numerous software choices, and scores of add-on options for the various packages.

DOS-based BBS software is also relatively economical. In addition to many low-cost shareware and freeware choices, the largest of the various BBS software companies are marketing DOS-based applications. Compared to other alternatives, prices are reasonable (even for the hobbyist) without sacrificing quality or features.

Microsoft Windows-based BBS software is beginning to emerge. The popularity of Microsoft Windows causes many potential sysops to seek out a Windows-based BBS. However, Windows in its current form is a poor choice for communications applications. As technology progresses, this situation may change. For now, however, Windows-based BBS software allows only small line counts on a single PC (compared to DOS-based BBSs).

OS/2-based BBS software is also beginning to emerge. Like Windows, OS/2 does not make an ideal platform for communications applications. Here again, the development of technology is likely to make this less so over time.

Often, the reason someone considers Windows- or OS/2-based BBS software is that they want a *graphical user interface* or *GUI* for their callers. What many people fail to understand, however, is that the platform upon which BBS software operates has little or nothing to do with the platform upon which callers operate when they dial the BBS. A DOS-based BBS, for example, does not preclude a Macintosh user from using the system effectively. Likewise, a Windows- or OS/2-based BBS software package doesn't mean that users will see a graphical interface when they dial in. The platform on which a BBS operates is for *your* benefit as sysop; what your callers see when they dial your BBS is a separate issue. If you're looking for a GUI BBS, look past the operating platform—it has little or nothing to do with the type of interface presented to a caller. (Graphical BBS technologies are covered later in this chapter.)

No matter what type of software is used, PC platforms are incredibly inexpensive compared to other types of computers. A PC perfectly capable of running 64 high-speed lines can be had for as little as $1,000 at this writing, and PC prices continue to fall. Comparable Macintosh systems or UNIX-based minicomputers generally cost significantly more.

The Macintosh Platform

Macintosh-based BBS software has been available for some time, and it continues to evolve. The relatively recent availability of multiport serial cards for Macintosh platforms has made it

possible for multiline BBSs to exist on a Mac; previously, Mac-based BBS software was limited to single-line systems or kludge solutions that strapped together multiple Macs to get the job done.

Most people consider Mac-based BBS software for one of two reasons:

- They have a personal preference for the Macintosh platform.
- They want a graphical user interface for their BBS.

The preference for a Macintosh is probably the most compelling reason to consider a Mac-based BBS. The long-standing rivalry between PC users and Macintosh users runs fairly deep. If your personal biases, experiences, or other reasoning causes you to look to the Mac as the platform for your BBS, you'll have several packages to pick from. Unfortunately, the BBS software market for the Macintosh is not as mature as the one for the PC. As a result, you're likely to be forced to make compromises if you stick with the Mac. Over time, this situation will, of course, change. Many vendors are solidly committed to the Mac platform and are working diligently to advance the state of the art.

As I explained previously with regard to Windows- and OS/2-based plaforms running on the PC, the fact that a BBS is Mac-based doesn't inherently give a graphical interface to the caller. The graphical orientation of the Macintosh and its users, however, has served to move many of the Mac-based BBS packages into graphical arenas. Mac users, especially those new to communications, resist the purely text-based operation of most BBSs; the methodology and function of such systems is a diametric opposite of the way they are accustomed to using their computers.

As a result, many Mac-based BBS software developers have worked to make themselves and other Mac users comfortable online by creating graphical BBS interfaces. The important point here, however, is to remember that graphical BBSs are not limited to graphical platforms, nor are text-based BBSs limited to text-based platforms. A Mac-based BBS doesn't necessarily provide a graphical interface, nor does it necessarily preclude a text interface.

Potential sysops considering a Mac-based BBS should also look closely at PC-based BBS software for reasons of cost and appropriateness to the task. Unless you're dead set in your choice of

the Macintosh, a PC-based system will generally provide more features at a lower overall cost than a Mac-based BBS. A costly and capable Macintosh is well suited to tasks such as page layout, but IBM-compatible PCs are available at practically throwaway prices (even for machines that offer high-end performance) and can run high line counts at high speed with little or no speed degradation. Still, if a particular Mac-based BBS software package provides a particular feature you need or want, or if you're reluctant to learn DOS (which you need to know for all of the PC-based packages), then a Mac-based BBS may be your best choice.

The UNIX Platform

Many new sysops consider a UNIX-based platform for their BBS. Unlike a PC or a Mac platform, UNIX-based platforms are oriented more toward the operating system rather than the specific computer hardware that is employed. In addition to the operating system, you still need to select a powerful desktop computer or workstation that can run UNIX (or a UNIX clone), as well as BBS software that is generally costlier than its DOS- and Macintosh-based counterparts.

UNIX and the various UNIX-compatible operating systems, at one time expensive purchases, have dropped in price over the years, making a UNIX-based system more reasonable. Several versions of UNIX and UNIX clones are available for inexpensive IBM-compatible PCs, enhancing the appeal of operating a BBS on the platform.

One of the biggest draws of a UNIX-based BBS, however, is the built-in internetworking capabilities included with UNIX and virtually every UNIX clone. These powerful tools include UUCP for store-and-forward mail compatibility and support for TCP/IP real-time connectivity (networking). The immense and growing popularity of the Internet, itself based almost entirely on UNIX-based systems, causes many people to look no further than a UNIX-based BBS. Even UNIX itself, without any BBS software, provides some level of BBS-like functionality.

Though Internet connectivity is coming to other types of BBS platforms, running a UNIX-based BBS is truly the best choice where solid, reliable, and total Internet connectivity is a requirement for your system. At this time, only a UNIX system can seamlessly and without compromise provide you with all types of Internet support, including telnet, ftp, e-mail, and newsgroups, concurrent with BBS functionality. This too is changing, with these capabilities rapidly becoming available on non-UNIX platforms in various forms and at various levels of integration and support.

UNIX is different in its basic concept than either PC-based or Mac-based platforms, and hence, the BBS software is different in concept. UNIX is a multiuser computing platform, which uses a concept of logging in as a user to the computer system, independent of the BBS. PCs and Macs are designed inherently for a single computer user. Although multiuser BBS software is available for these platforms, the BBS software (sometimes with the help of other software) handles logins and multiple user accesses. On a UNIX system, these services are inherent in the operating system. Although these issues are transparent to callers on your BBS, you should be aware of the conceptual difference when analyzing your platform choices.

One of your choices when you consider a UNIX system is whether you need BBS software at all. As I mentioned previously, a variety of BBS-like functions are provided by an unembellished UNIX system. They include file transfers and e-mail, two of the most popular BBS features. UNIX systems also offer some degree of remote hosting, because of the design and construction of text-based UNIX platforms. Although the user interface of a plain UNIX system is relatively raw and unfriendly, it's not inappropriate for some operating environments. Computer users in many educational and corporate environments are already accustomed to working with UNIX; in these situations, a plain UNIX system with no BBS at all might represent the ideal solution to the problem you want to solve with a BBS.

Finally, UNIX is offered in a variety of flavors. UNIX itself comes in many different forms, and UNIX clones such as XENIX and Coherent are available. The particular UNIX you need will depend on the computer you'll be running it on. Keep in mind

that a particular UNIX BBS package won't necessarily run under all flavors of UNIX or on all otherwise UNIX-compatible hardware platforms. Seek advice on these issues from the UNIX BBS software vendor you choose to deal with.

Summary of Computing Platforms

Your choice of computing platform should be one you're prepared to stick with over the long term. Therefore, give due consideration to all the material provided in this section to ensure that you make an informed and appropriate choice. Table 3-1 shows a comparison chart of many platform-related issues, and how each platform rates.

Table 3-1
Platform-Related BBS Issues Compared

Issue \ Platform	PC (DOS)	Macintosh	UNIX
Computer Cost	Low	Moderate	Potentially High
Performance	High[A]	Average	Low to Average[B]
BBS Software Cost	Variable	Variable	Moderate to High
BBS Software Choices	Many	Limited	Very Limited
Feature Availability	Advanced	Average	Limited to Average
Add-On Availability	Many	Limited	Many[C]
Shareware Choices	Yes	Some	Few (if any)
Internet Connectivity	Limited	Limited	Outstanding
User Interface	Friendly	Friendly	Comparatively Harsh
Graphical User Interfaces	Some	Common	Some, Usually Proprietary
Line Counts Possible	High[A]	Limited	Limited[D]

[A] Dependent largely on BBS software selected.

[B] Dependent on line count; operating system overhead can be substantial in many cases.

[C] On UNIX systems, most so-called "add-ons" are operating system level enhancements.

[D] Requires multiple systems to maintain reasonable performance as line counts increase.

Integrated Versus Multinode BBS Software

As I mentioned previously, most BBSs are operated on PC-based platforms under DOS. If you choose this most popular of BBS platforms, your next decision will be what type of BBS software you'll need: *integrated* or *multinode*.

The choice of integrated versus multinode software applies only if you intend to run a multiline BBS. Single-line BBSs are usually implemented with native single-line software; if you intend to run a single line now but multiple lines someday, read this section with your future needs in mind.

This section pertains mostly to DOS-based systems. Macintosh and UNIX BBS platforms are both analogous to integrated BBS software, though the specifics vary from one BBS package to the next.

Multinode BBS Software

Multinode BBS software requires one copy of the BBS software running for each incoming line to the system. This can be done with an *external multitasker*, with a *local area network* (LAN), or both. Figure 3-1 shows a typical multinode configuration.

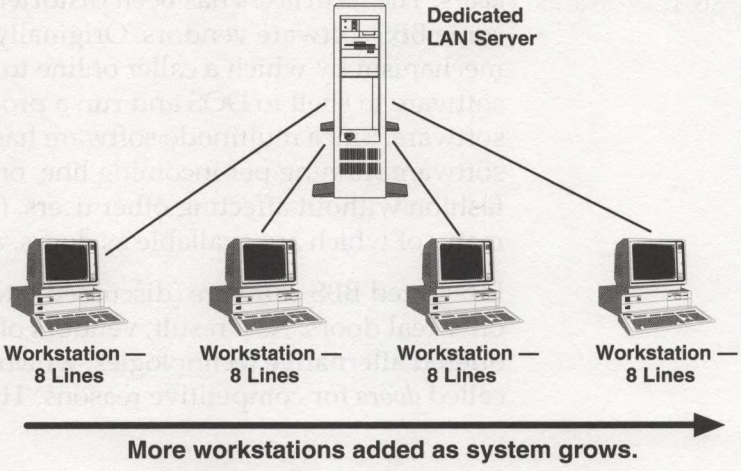

Figure 3-1
Multinode BBS hardware configuration

Traditionally, multinode software has required one PC per incoming line, all connected through a LAN. For a 16-line system, 17 separate PCs were required (16 for the lines, and at least 1 as a server). Systems are still in operation that use multinode software and that have enormous rooms full of PCs for the operation. Some successful BBS systems have, as they've grown, been forced to add air conditioning and to expand the capacity of their electrical service to deal with the large numbers of PCs required for the BBS.

In the last few years, vendors of multinode BBS software have endeavored to reduce the hardware required for their systems. Using multiport serial cards (serial cards that have several serial ports on a single card) plugged into the PC, and using an external, general-purpose multitasker such as DESQview, these systems typically run 8 to 10 lines per computer (sometimes more, under certain conditions). Line counts beyond this still require multiple PCs and local area networks, but a smaller total number of machines is required, and fairly large systems can be run in an ordinary room without special electrical feeds or cooling.

The key point with multinode BBS software is that there is always one copy of DOS and of the BBS software running per line. Whether that copy is physical (one per PC, with multiple PCs) or virtual (several per PC with a multitasker), there is one copy running per line, and that's what makes a BBS of this type multinode.

The primary benefit of multinode systems is a technology called *doors*. The term *doors* has been distorted through its misuse by some BBS software vendors. Originally, the term referred to a mechanism by which a caller online to the BBS could instruct the software to shell to DOS and run a program external to the BBS software. Since multinode software has one copy of the BBS software running per incoming line, one line can exit in this fashion without affecting other users. (BBS software extensions, many of which are available as doors, are covered in Chapter 4.)

Integrated BBS software (discussed later in this chapter) cannot offer real doors. As a result, vendors of integrated software have offered alternative technologies, which have in some cases been called *doors* for competitive reasons. Through this misuse of the

term, *doors* is often used generically to describe any mechanism by which a BBS can run programs online, regardless of how they are implemented. However, the original, true, shell-to-DOS doors are exclusive to multinode software; no integrated software is capable of offering them.

In addition to true doors, multinode software generally offers better system maintenance options than integrated BBS software. The reason is that multinode software is structured for multitasking or LAN environments from the bottom up; having another window open in the multitasker or a LAN workstation handling sysop maintenance functions while the system is up and running is a rather simple extension to an existing structure. The same functionality is technically more difficult to implement in integrated environments, and it is one of the trade-offs you often must make when you choose an integrated system.

This openness of the operating environment of multinode software also allows you to easily integrate third-party extensions and utilities for the BBS. Often these are implemented as doors, but they may also be regular programs you run within the multitasker or from a LAN workstation.

The downside to multinode BBS software is its hefty hardware requirements. Even if you'll be running just a few lines, the level of computer power needed for the job is more than likely substantially greater than a comparable integrated BBS needs. For example, you'll need a high-end 486 computer with at least 8Mb of RAM to run 8 to 10 lines using a multitasker such as DESQview with a multinode BBS package. That same computer can run 64 lines or more using integrated software. When you go beyond the 8 to 10 lines, multiple computers plus local area network software and adapters are required, whereas integrated software runs on a single PC.

Depending on the line count, the bottom line is that a multinode BBS is generally much more expensive than a comparable integrated BBS. For the added cost, you get the ability to run true shell-to-DOS doors that integrated software cannot provide.

Integrated BBS Software

Integrated BBS software can run multiple incoming lines under a single, integrated program, without the need for local area networks or external multitaskers. Integrated packages have the multitasking, multiuser elements of the system built into the BBS software, rather than relying on external systems or software. Figure 3-2 shows a typical configuration using integrated software.

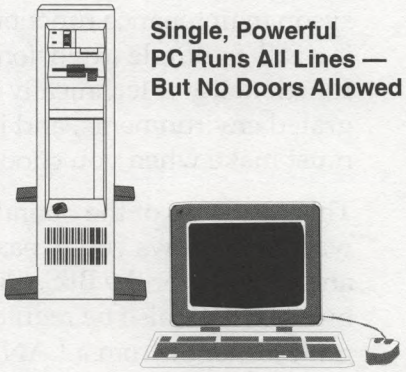

Figure 3-2
Integrated BBS hardware configuration

The various integrated BBS packages take a different approach to the problem of how to connect all of those modems to a single machine. The first way is with multiport serial cards. These cards provide large numbers of serial ports, which you use to connect the modems (or other types of connections) to the system. With multiport serial cards, you use external modems.

The next option is with an expansion chassis. A chassis is a way to expand the *bus* (the part of the PC where you install plug-in cards) to support large numbers of plug-in cards. With an expansion chassis, you use internal modem cards (which is the purpose of the chassis—it provides a place to plug in all those modems).

The final option is the multimodem card, a multiport serial card and modem all in one. This is the least popular choice, because the modems are limited to 2,400bps (slow by today's standards). Technology may soon bring us multimodem cards with high-speed

modem support (if they're not already available when you read this). Until then, multimodem cards are not recommended except in special cases where slow modem speeds are acceptable.

Most integrated BBS software packages have surprisingly good efficiency. Since the multitasker is not general-purpose in its scope (as is the case with multinode software), developers of integrated software have been able to highly optimize the performance of their systems. Depending on the BBS software package you select, the number of lines you need to run, the modem speeds in use, and the PC you select, you'll find that in most cases integrated BBS software offers performance equal to (and in some cases better than) multinode BBS software, despite the number of lines packed onto a single computer.

Therein lies the biggest single advantage of integrated BBS software: its ability to run on just one PC. Integrated software can run 32, 48, or 64 lines, and more, all on a single DOS-based PC. A 64-line system with multinode BBS software would require around ten high-end PCs to get the job done, ten times more PCs than you need with integrated software. The drastically reduced hardware requirement is the primary reason people opt for an integrated BBS package.

The trade-off with integrated BBS software packages is that they do not offer true door capability, without exception. Since the multitasking core of an integrated BBS is not general-purpose in its design, true doors are technically impossible. As I mentioned previously, some integrated BBS software vendors have taken to calling some types of online program execution *doors*. These doors are provided in two ways.

Some BBS software refers to integrated modules written to a special *API* (applications programming interface) as doors. This mechanism is known as an *integrated* (or integratable) *program* or a *captive linked door*, since the door software is captively linked to the BBS software through programmer's hooks. These are not doors in the true sense of the word, since the BBS is not shelling out to the operating system to run the program. Rather, the program is loaded into memory coresident with the BBS software and runs in conjunction with it.

The important point to remember with such software is that the door cannot run with other BBS software, and the BBS software can't run doors of this type designed for other BBS packages. (On the other hand, the true doors run by multinode BBS software are generally interchangeable between various BBS packages.) In other words, the door is captive to the BBS software, and vice versa. Authors of captive linked doors are usually forced to use a particular programming language and compiler, without the flexibility to use the language and compiler of their choice.

Other BBS software vendors use the term *door* generically to describe *gateway doors*, a mechanism by which a BBS caller on one line is connected using an outbound gateway through another line to an additional, physically separate PC that executes the door software. Gateway doors are inherently limited; if a particular gateway door is in use by one caller, then another caller to the BBS is unable to use it unless there is another machine and another gateway door running the same program. Although multitaskers such as DESQview can be used, here again, the number of simultaneous accesses to a single machine running gateway doors is necessarily limited by hardware or the capability of the multitasker itself.

Servicing large numbers of callers who all need access to a particular door is not especially viable without huge numbers of PCs running the door application, which negates the benefits of choosing integrated software in the first place. For limited situations where simultaneous access isn't needed, or for cases where you wish to set one up for your own use as sysop, a gateway door is a simple and effective solution. For multiple simultaneous use of the door, however, a gateway door is impractical.

Neither captive linked doors nor gateway doors are true shell-to-DOS doors. If you need shell-to-DOS doors, you must select and run multinode BBS software.

If you choose integrated software for your BBS, and you think you may want gateway doors or linked doors for your system, be sure to ask the BBS software vendor whether it supports the addition of extension software, and if so, how such extensions are implemented. If you intend to be programming your own

extensions to the system, ask the software vendor whether this is supported, and if so, how it is implemented on its particular software. (BBS add-ons are discussed in Chapter 4.)

Hybrid BBS Software

Hybrid BBS software is just beginning to emerge as a third category. As the name suggests, hybrids are a combination of multinode and integrated BBS software. They are integrated in that they run several lines without the need for an external multitasker, and hence, do not offer true doors. They are multinode in that multiple copies of the software can be networked to increase the total line count.

Hybrids are the only effective means to run high line count BBSs on a personal computer platform of any kind. Each machine handles some number of lines by itself, then multiple PCs are employed to scale up the line count to enormous proportions. With hybrid software, it's possible to run BBSs with hundreds and hundreds of incoming lines, far larger than even the most successful BBSs running today (and rivaling the size of some of the smaller commercial online services).

The Cost/Software Selection Trade-Off

In Chapter 2, I outlined many of the things you need to consider as you cost out your BBS. In this section, I want to bring these elements together by pointing out how the decisions you make in selecting BBS software will force certain hardware decisions on you. This relationship boils down to a trade-off between the software you select and the total cost of your system.

You can choose to manage this trade-off in one of two ways: the cost guides your decision, or the decision guides your cost. If you have the luxury, go with the latter; pick what you want based on whatever criteria you want, and write the check. For most potential sysops, however, cost is an issue. If that describes you, then you must make your software selections carefully, for a

particular choice can have a tremendous effect on the size of the checks you'll be writing as you put your system together.

The Cost of the Computer Platform

As I mentioned earlier in this chapter, the platform you select for your system is the first decision you'll make. This decision will focus your hardware buying to a particular area.

For example, if you want to run your BBS on a Macintosh, then of course a Macintosh computer will be needed. Macs have a higher average cost than an IBM or compatible PC of comparable power, so the decision to use a Mac might increase the total cost of your BBS compared to a PC-based solution. Multiport serial interface solutions for Macs, necessary to support a multiline BBS, are also more costly than comparable PC-based solutions.

Deciding to run your BBS on an IBM PC or compatible, like the majority of BBSs in operation, stands to reduce the cost of a single unit of computer hardware. Even powerful PCs can be had for $1,000 to $2,000 each for complete systems suitable for BBS operation, much lower than a Macintosh in most cases, and less expensive than a UNIX-based platform as well. In fact, comparatively low cost is the main reason most BBSs are operated on a PC.

UNIX-based BBSs can sometimes be operated on standard PC-compatibles, but more commonly are run on costly workstation hardware from companies such as Sun. These powerful machines are significantly more expensive per unit than either Macs or PCs. Your decision to run a UNIX-based BBS will substantially drive up costs for hardware. As I mentioned previously, you also have the cost of the UNIX operating system (or a clone), which is often expensive.

When looking at the platform on which you'd like to run a BBS, you need to take some time to weigh the costs of the platform relative to the problem you're trying to solve. If you need a high level of Internet-style connectivity, for example, the cost of a UNIX-based BBS will likely be less expensive than attempting to

implement the same solutions on a PC-based platform. Macintosh computers are generally regarded as expensive relative to their computing power when compared to a PC platform. Does your project really require a Macintosh-based solution? These are just some of the ways to look at how the platform you select will drive up costs—or may save you money over the same solutions implemented on another platform.

When thinking about platform-related costs, you might wish to use the cost information I provided in Chapter 2 to develop some cost comparisons for your system between different platforms. Use the information as a base, obtain actual costs by calling vendors, and come up with total costs for multiple solutions to determine which is best for you. (I'll go over this type of analysis later.)

The Cost of the Software Type

If you select a PC-based platform for your BBS (as most BBS operators have), then the next way in which your software selection will determine your cost is in the type of software you pick.

Here again, the particular system you're trying to create or problem you're trying to solve may dictate a particular choice. You may find yourself having to make a decision, regardless of its cost, in order to get the system you need or want. If you have not yet decided on the software type you'll want, then you need to understand the costs.

Generally speaking, multinode software is the most costly type of PC-based BBS software, but the actual costs depend on the line count you need. For example, an 8-line multinode system may actually cost less than an integrated system, but it won't stay that way if the system grows. If your application requires true shell-to-DOS doors, then your answer is simple: You must use multinode software. If your application does not require shell-to-DOS doors, then you'll likely find the functionality you need and save money by selecting and using integrated software.

The important element here is to take into account how much you expect the system to grow. Small systems that stay small are an ideal case where multinode software makes sense, since it's

usually the least expensive solution. But systems that start big or grow to be big should select integrated software in most cases. Think of the long term when making this decision to avoid boxing yourself into a corner later on.

INSIDER TIP. . . Comparative Cost Analysis

In Chapter 2, I outlined the elements that go into the total cost of putting a BBS together. The object of that exercise was to gain perspective on what it takes to start your BBS. Part of selecting software and a computing platform, however, is comparative cost analysis—comparing the cost of one solution with another.

The most important aspect of cost analysis to consider is the total cost; most sysops naturally tend to compare only some of the costs involved, instead of the total cost. For example, you may tend to look only at the software—how much does it cost, what features does it have, and so on—and fail completely to look at hardware costs. You may look at modems in isolation, without considering matters such as how they need to be interfaced with the BBS. You can use the information in Chapter 2 as a guide to make sure you've included everything in your analysis.

You can perform comparative cost analysis in two ways. Both methods begin by adding up the total cost of all hardware and software required for a particular system, for a particular line count. This figure yields the total cost of a solution. This is in essence what you did by completing the worksheet in Chapter 2.

However, one of the best numbers to compare with is the per-line cost. Simply divide the total cost by the number of lines to arrive at this figure. Note that it's important to work up the per-line cost for various line counts; even the same software and operating platform will have variable per-line costs. You can then average this figure for the purposes of general comparison.

Keep in mind that you don't need to include fixed costs (such as telephone lines, rent, and so on) in your comparative analysis, since these types of costs stay the same regardless of the type of BBS you choose.

A spreadsheet is the best way to add up these costs. Table 3-2 shows part of a spreadsheet I prepared. This spreadsheet is based on a cost analysis of a major multinode software package (using summer 1993 prices). The original version of this spreadsheet has columns for every line count, from 1 line to 24 lines. The average of the 24 per-line costs for this configuration is $959.40 per line.

Performing the same cost analysis on three other BBS packages yielded the following results: another major multinode package ran $1,004.69 per line on average, and the averages for two integrated packages were $736.10 and $786.14. If you take the time to add up the total and average costs of various BBS choices in this fashion, including all hardware and software, you can quickly get an idea of the real cost of one solution versus another.

If you compare the per-line cost for a particular line count between multiple solutions, you'll find that a given solution that's least expensive for one line count may be the most expensive for another line count. Note how, in Table 3-2,

Table 3-2
Partial Analysis of Per-Line Costs of a BBS

Lines	2	4	8	12	16	24
PC	$1,500.00	$1,500.00	$1,500.00	$4,500.00	$4,500.00	$6,000.00
Multiport Hardware	$0.00	$0.00	$1,035.00	$2,070.00	$2,070.00	$3,105.00
Modems	$598.00	$1,196.00	$2,392.00	$3,588.00	$4,784.00	$7,176.00
Multitasking Software	$178.00	$178.00	$178.00	$356.00	$356.00	$534.00
BBS Software (Base)	$170.00	$340.00	$340.00	$680.00	$680.00	$680.00
BBS Software (Upgrade)	$0.00	$0.00	$100.00	$100.00	$100.00	$100.00
LAN Hardware/ Software	$0.00	$0.00	$0.00	$785.00	$785.00	$1,020.00
Operating System	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL	$2,446.00	$3,214.00	$5,545.00	$12,079.00	$13,275.00	$18,615.00
PER-LINE COST	$1,223.00	$803.50	$693.13	$1,006.58	$829.69	$775.63

2 lines cost $1223.00 each, and 8 lines cost $693.13 each; this widely variable per-line cost is not unusual. Take into consideration future expansion before you jump at the cheapest solution, because it may not stay so cheap as you grow.

Spreadsheet software, such as Lotus 1-2-3 or Microsoft Excel, is an ideal way to manipulate and arrive at these figures. With minor options, such as which modems you want to buy, you can plug in a different cost and see the immediate result on the bottom line. Replicating the spreadsheet so you can analyze major options (such as platform or BBS software package) allows you to easily compare one solution to another. Even if you have to work this analysis on paper, however, it's time well spent on your planning. Take the time now to understand your choices and their impact before you make final decisions.

Here's a summary of what I included for each category in my spreadsheet:

- **PC** This is the cost of the PC that the particular BBS software requires. With multinode software, this usually means multiple PCs; make sure you cost out the number of PCs needed. Count all direct PC costs here, including hard disk(s), monitor(s), keyboard(s), printer(s), and so on.
- **Multiport hardware** This is the cost of multiport serial cards or expansion chassis needed to hook up multiple modems. What is required and the cost of the hardware depends on the BBS software. Make sure you correctly count the number of these devices you need for each line count you're analyzing.
- **Modems** This is the total cost of the modems for the given line count. Remember, you need one modem per line.

- **Multitasking software** If the BBS package you're analyzing requires external multitasking software (such as DESQview or OS/2), this is the cost of that software. If multiple PCs are required, make sure you plan on one copy of the software for each PC (with few exceptions, it's illegal to run the same copy of the multitasking package on multiple PCs).
- **BBS software (base)** This is the cost of the BBS software. Make sure you have the correct costs for the various line counts. Most BBS software is available in versions that either support a given number of lines directly, or are licensed for use on multiple PCs to support a given number of lines. If multiple copies are required, be certain you've costed out the number of copies you need.
- **BBS software (upgrade)** This is the additional cost (if applicable) for BBS software beyond the base price. For example, some BBS software requires an additional module to support multiport serial cards; enter the cost here for any such additions that are required.
- **LAN hardware and software** This is the cost for local area network hardware (adapter cards, concentrators, and so on) and software (the network operating system) needed for your BBS. (Count the cost of server PCs under the PC heading, rather than here.) Remember that integrated BBS software doesn't require a LAN. Make sure you correctly count and include the cost of network adapters, and the software licenses required for the multiple PCs, for each line count you're analyzing.
- **Operating system** This is the cost for the operating system software, and it is usually an issue only if you're planning to run a UNIX-based BBS.

Selecting Software

Like virtually every software category, BBS software is available in two basic forms: commercial and noncommercial. Commercial software is sold through conventional means; you buy it directly from the manufacturer, from a software retailer, or from some other type of software distributor. Noncommercial software is available in two varieties, shareware and freeware. Shareware allows you to try before you buy, and freeware is free for the asking.

Commercial BBS Software

Commercial software is used on the majority of successful BBSs. Commercial software provides many advantages: printed

documentation, technical support, a generally higher level of reliability, and security. You also get the comfort of dealing with an established company.

Unlike word processors and spreadsheets, commercial BBS software is not always available through common software retailers. You may need to contact the manufacturer and buy the software directly. Direct resellers are also coming onto the scene that specialize in BBS software and hardware, and that frequently offer discount pricing. Advertisments in trade journals such as *Boardwatch Magazine* are an excellent way to locate such resellers.

Some commercial makers of BBS software are difficult to find. The Appendix has a list of current BBS software vendors. Trade journals are a good way to keep up with new entries to the marketplace, as well as new products and features offered by existing vendors.

BBS Shareware and Freeware

One alternative to commercial software you may wish to consider is the shareware and freeware category. With shareware, you can try the software for a reasonable period, and pay for it only after you've established it will meet your needs. With freeware, you don't have to spend a dime on the software—just use it.

If you've guessed this might be a bit too good to be true, you may be right. Some BBS shareware and freeware is of excellent quality and reliability. In fact, some of the most popular BBS software packages today are released as shareware and freeware. In other cases, you get what you pay for: not much.

Although registering your shareware will often yield technical support and documentation, in most cases (especially during the evaluation process), you're on your own when it comes to shareware. You're virtually always left to your own devices with freeware (which is why it's free). This lack of direct support, especially up front when it's usually most important, makes shareware and freeware a less than ideal choice for most business or entrepreneurial applications (although many such applications do in fact employ BBS shareware or freeware). The hobbyist sysop should take a serious look at this category of software—many of these

packages are ideal choices for the hobbyist, and they have the advantage of being much lower in cost than comparable commercial software.

BBS shareware and freeware is available from many sources. Major online services, such as CompuServe, have BBS forums with many packages available for download. Call local BBSs in your immediate area; many have BBS software posted for download as well. If you're not currently online via modem, often computer user groups have shareware and freeware libraries; this may be a good source for you. Shareware and freeware disk vendors (which advertise in the classified sections of major computer magazines and in trade journals) usually carry BBS software in their catalogs. Finally, many makers of BBS shareware maintain offices and/or telephone numbers; you can often obtain copies of their software directly, usually for a small disk-duplicating fee.

PC Multitaskers

As I discussed previously, PC-based multinode software requires an external multitasker to function on a single computer. If you're contemplating multinode software that operates this way, there are some things you need to know when investigating your software decisions.

How Many Lines Are Possible?

Most multinode software can run 2 (and possibly 4) lines under a multitasker using only regular serial ports. To achieve high line counts on a single PC, all require multiport serial cards. Most packages run 8 lines on a single machine using a multiport card. A few run 10 lines, generally by using a combination of multiport serial hardware and traditional communications ports.

As technology advances, it may be possible to run even higher line counts on a single machine with multinode software. In fact, some manufacturers are already claiming higher line counts. At

this writing, however, plan on 8 to 10 lines per computer when running multinode software if you expect full system performance during all BBS functions. The higher line counts are possible only when users' activities are limited to simple, nondemanding functions such as file downloading.

One question potential sysops have is why multinode software is limited to such a small number of lines per PC, while integrated BBS software supports up to 256 simultaneous lines on a single computer in some cases. The answer is that the general-purpose multitaskers used by multinode software simply aren't powerful enough to accommodate more lines. The key is that these multitaskers are *general-purpose*—they are designed to blindly multitask applications software without regard to what type of application is running. They're as comfortable with a spreadsheet or word processor as they are with BBS software.

Integrated BBS software has a multitasker built into the software. This multitasker, however, is not general-purpose in its design, and it is not intended to be. It's designed specifically to run a BBS, and therefore, developers of this software have an opportunity to highly optimize the performance and operation of the multitasker. The multitasker itself, as well as all of the tasks that run underneath it, are designed by the BBS software developer. The fact that everything is a known quantity means that the multitasker can make more assumptions about things than a general-purpose multitasker is able to. This is why multinode software is limited to 8 to 10 lines per PC, and why integrated software runs 48, 64, or 128 lines—all the way to 256 lines on a single computer.

DOS Multitaskers Versus Windows

The most popular multitasker for multinode BBS software is DESQview, a mature, powerful DOS-based multitasker. DESQview is among the most established and refined products of its type for PCs, which is why it's popular for BBS applications.

Among PC-based multitaskers, however, Windows is the users' choice. Windows adds an attractive graphical user interface

(GUI) to all types of applications. Computer users who rely on Windows for database programs, page layout, or other uses, often seek out a Windows-based BBS package, desiring to work in an environment they know and enjoy. Windows, however, is a less than ideal platform for BBSs, and it is apt to remain that way. Why?

Windows, like DESQview, is a general-purpose multitasker. It is not optimized for communications; in fact, *interrupt-driven communications*, the type most used for PC-based communications (including BBSs), is miserable under Windows with slow performance and character loss common. A single communications session may well be acceptable, but multiple communications sessions taking place simultaneously under Windows tend to drag the system, offering poor online performance for callers. At this writing, systems of 2 to 4 lines can be attained under Windows, but more than that is simply unrealistic. Future generations of Windows are not likely to change this dynamic substantially.

The only way that Windows may become a viable BBS platform is through the use of *intelligent communications interfaces*. This method of interfacing modems to your PC doesn't use interrupt-driven methodology at all. Rather, special software-driven techniques are employed. This is how multinode BBS software attains more than 4 lines using DESQview—through the use of intelligent multiport serial cards. At this writing, such interfaces for Windows are just beginning to emerge. Even with these interfaces, it's unlikely that Windows will be viable for more than the same 8 to 10 lines that multinode software can achieve using DESQview, leaving integrated BBS software as the only way to have higher line counts on a single computer.

Considering the OS/2 Option

The issues surrounding OS/2 as a BBS platform are virtually identical to the issues surrounding Windows. Like Windows, OS/2 is a graphical multitasker. Unlike Windows 3.x, however, OS/2 2.x is an operating system, rather than a software layer that requires MS-DOS.

The fact that OS/2 is its own operating system makes the platform somewhat more viable for use as the foundation of a multiuser

BBS. Like DESQview and Windows, however, OS/2 is still a general-purpose multitasker. As such, it's simply not technologically possible to run large numbers of simultaneous tasks (especially communications tasks) without performance trade-offs unless intelligent communications interfaces are used. Such interfaces designed for use with OS/2 are beginning to emerge, but the platform will likely never achieve the performance offered by integrated BBS software that is optimized specifically for the BBS function.

Online Graphical Interfaces

The reason most often cited by potential sysops for seeking a Windows- or OS/2-based BBS is that they want a graphical interface for their system. Without having operated a BBS before, it's difficult for many people to envision how a BBS interfaces with callers, which leads to the misconception that a BBS that runs from a graphical platform will have a graphical interface.

In reality, the interface presented to callers is completely separate from the interface you (as the sysop) have to your BBS software. Whether your BBS runs under Windows or DOS, it may have a textual interface to callers or a graphical one. What it has depends more on the BBS software you select (or what options you choose for it) than on any other factor.

Textual Versus Graphical Interfaces

Traditionally, BBSs have offered textual interfaces to their callers as shown in Figure 3-3. Textual interfaces are virtually the oldest type of truly interactive computing. The computer displays information to a computer user in the form of characters on a video screen, and the user enters information on a keyboard.

Textual interfaces grew from printing terminals, which had a keyboard, but no display—the computer output was printed on

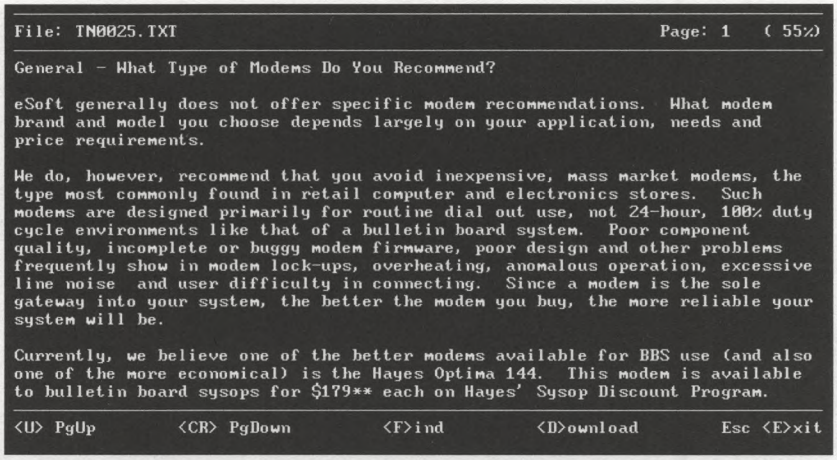
File: TN0025.TXT Page: 1 (55%)
General - What Type of Modems Do You Recommend?
eSoft generally does not offer specific modem recommendations. What modem brand and model you choose depends largely on your application, needs and price requirements.
We do, however, recommend that you avoid inexpensive, mass market modems, the type most commonly found in retail computer and electronics stores. Such modems are designed primarily for routine dial out use, not 24-hour, 100% duty cycle environments like that of a bulletin board system. Poor component quality, incomplete or buggy modem firmware, poor design and other problems frequently show in modem lock-ups, overheating, anomalous operation, excessive line noise and user difficulty in connecting. Since a modem is the sole gateway into your system, the better the modem you buy, the more reliable your system will be.
Currently, we believe one of the better modems available for BBS use (and also one of the more economical) is the Hayes Optima 144. This modem is available to bulletin board sysops for $179** each on Hayes' Sysop Discount Program.
<U> PgUp <CR> PgDown <F>ind <D>ownload Esc <E>xit

Figure 3-3
A textual interface

paper. Video terminals evolved next and were at first simply substitutes for a printing terminal, displaying an endless stream of characters to a video screen instead of to paper. Engineers next developed ways for the computer to control the video terminal—clearing the screen, moving the cursor around, and changing the colors on terminals that had color video screens. These terminals also offered ways for the user to move the cursor about, as well as special keys (such as function keys) to generate commands that were sent to the computer. When video terminals were at their peak of usage, computers were expensive devices that had to be shared among several users. Video terminals connected these users to the shared computer, often located in a separate room or building, and sometimes even in another city (accessed by dial-up modem, as we do with BBSs today).

On modern personal computers, communications software for modems is often called terminal-emulation software because it makes a computer behave like the video terminals of years gone by. Video terminal technology is decades old, but it still forms the basis of BBS access. The user interface that can be provided by regular terminal emulation is text-based, meaning that graphics (such as charts, photographs, and so on) cannot be displayed.

At this writing, numerous terminal emulation standards exist. Only two are used widely on BBSs: TTY and ANSI. TTY, short for Teletype, behaves like a printing terminal. There is no cursor

control or other features; information simply flows or scrolls down the screen. ANSI (somewhat of a misnomer and actually American National Standards Institute standard X3.64) is a terminal-emulation standard similar to the DEC VT-100/VT-102 video terminal. There is basic cursor and color control from host to terminal, as well as support for certain terminal-to-host key sequences.

These online text-based interfaces have been around for years, but presenting graphics by modem is still in its infancy at this writing. Some methods are available, but they address only some of the needs people have for graphical presentations in an online environment. Somewhat primitive forms of online graphical interfaces are showing signs of being widely accepted now, and by the end of the century will be commonplace among BBSs. Figure 3-4 shows a graphical interface. Note the arrow-shaped mouse cursor the caller can use to make a selection.

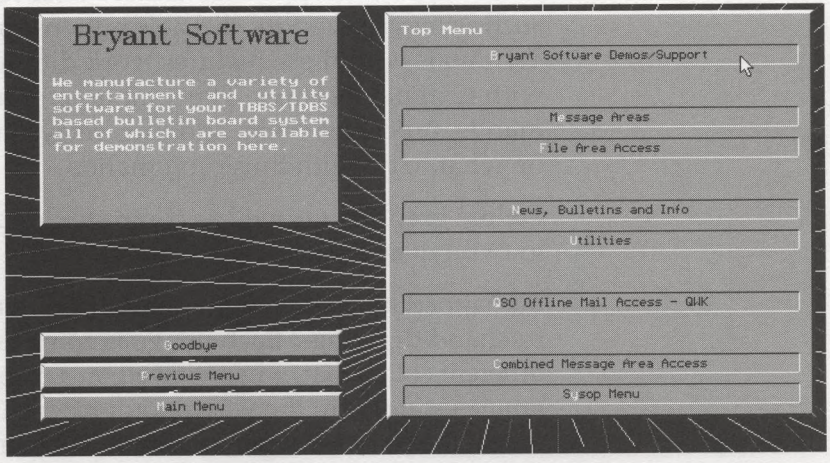
Bryant Software
We manufacture a variety of entertainment and utility software for your TBBS/TDBS based bulletin board system all of which are available for demonstration here.
Goodbye
Previous Menu
Main Menu
Top Menu
Bryant Software Demos/Support
Message Areas
File Area Access
News, Bulletins and Info
Utilities
QSO Offline Mail Access - QWK
Combined Message Area Access
Sysop Menu

Figure 3-4
A graphical interface

Despite graphical interfaces coming onto the scene, most BBS sysops need to be content with a text-based interface, or deal with an early graphical method that may not address all their needs. Even after online graphical interfaces have become further developed and common, there will remain a huge base of computer and data-terminal users who will not have the tools to

display these graphics, and who will expect the availability of a text interface when they dial your BBS. As you explore graphical interfaces, remember that for the widest user appeal and acceptance of your system, you must provide a textual interface in tandem with a graphical one—at least in any situation where the general public will be accessing your system.

Learning How Graphical Technologies Work

Graphical interfaces for the online environment all work basically the same way: the host sends instructions to the remote terminal. These instructions specify what images to draw, what colors should be used; in short, instructions on how to replicate the desired image on the screen of the remote user's computer.

Some types of graphical interfaces offer features for the end user, such as mouse support, clickable buttons, and drop-down menus. Terminals with these features work differently than terminals with textual interfaces. The remote terminal accepts user commands, processes them, and then relays information to the host on what to do with those commands.

Online graphics (as well as computer graphics in general) come in two types: *bitmapped* (also called *raster*) and *vector* images.

Bitmapped images include scanned photographs and some types of freehand drawings. Each image is composed of tiny dots of different colors that, when viewed on a computer screen, create an image—similar to the way photographic images printed in a magazine or newspaper are created. When you view such an image with a magnifying glass, you see a mosaic of these dots. If you're familiar with computer paint programs or photo retouching programs such as PC Paintbrush or Photostyler, or if you use a scanner, then you've seen or used bitmapped computer images.

Vector images may be represented on a computer screen as a series of dots, but the images themselves are composed as a series of instructions on how to create a drawing. For example, a vector

image may contain a computer representation of instructions like "draw a red rectangle 1 inch square in the upper left corner of the screen," or "draw a line from here to here, and make it blue." These instructions, called *primitives*, are the basic elements of a drawing.

Vector images are sometimes referred to as *line oriented* since the most basic primitive is a simple line. All the other primitives (except circles, ellipses, or other curved items) are composed of straight lines. Two of the most common examples of vector images are CAD (computer-aided design) software or computer draw software (such as CorelDRAW! or Micrographx Designer).

Realizing the Limitations of Graphics Online

You must understand several limitations with online graphical interfaces. The biggest limitation is remote terminal software.

At this writing, even the most popular graphical format for BBS use has a very small number of implementations for remote users. Although the situation will change over time, until then, if you implement graphics online you can plan on requiring your users to run a particular terminal program to view the graphics—rather than the software they may prefer. Callers may or may not be willing to consider running the software needed to display the graphics. As I said previously, you should count on offering both a graphical and a textual interface for callers until graphical interfaces are ubiquitous in the online world.

Expect acceptance of graphical interfaces among terminal programs to take some time. ANSI, the simple color and cursor-control enhancement to basic TTY textual interfaces discussed earlier, is still not available (or is poorly implemented) in many prominent communications software packages—after years of widespread implementation and acceptance among bulletin board systems. The simple fact is that BBS sysops tend to adopt new technologies long before other players in the online communications world.

Terminal software choices are even more problematic when you consider the issues of computer platform. If you choose a graphical interface for your BBS, is there terminal software available for Macintosh users? What about PC users? Does the PC terminal software run under DOS, or is Microsoft Windows required? Here again, your users may not have what's required to run the necessary terminal software. Think carefully about your decisions before you inadvertently lock out a segment of your potential user base from accessing your system fully.

Transmission speed is the next issue, primarily with bitmapped images. Scanned photographs, for example, can be enormous in size even when squeezed with file-compression software. What many people fail to understand is that the amount of time it takes to display such an image online is the same time it takes to transmit the file via the modem connection. One of the most common online bitmapped graphics formats, CompuServe's GIF format, has particularly large image files. An 800 by 600 image (measured in *pixels*, the dots that compose the image) with a full *color palette* of 256 colors can be as large as 300,000 bytes. Even at today's highest dial-up modem speeds, an image that large can take nearly 3 minutes to transmit. That means users must wait 3 minutes for the image to fully display on their screen. Such a delay is unacceptable except for casual, public BBSs.

This is why vector images are so popular in online environments. Even fairly complex vector images are usually quite small, displaying very quickly to users' screens. However, vector formats don't have a way to display true photographic-quality images; although it's sometimes possible to convert bitmapped images to a vector format, the resulting vector image is so incredibly complex that it's nearly as large as (and sometimes larger than) the original bitmapped image file, resulting in little or no net transmission speed savings. There are also trade-offs in image quality, since vector formats simply aren't designed for photographic-style images.

Finally, image-creation software can be a stumbling block. If you choose a graphical interface for your BBS, how are the images created? Can you create images in your preferred drawing software, or do you have to use special software for the job? How easy is the software to use? These are important issues,

especially if you're not a graphic artist. If it takes you hours to create a single menu for your BBS with the image-creation software, is it worthwhile exploring a graphical interface at all? It might not be.

INSIDER TIP. . . Graphics Online—The State of the Art

Graphical online technology is advancing very quickly. During 1993 and early 1994, graphics online has grown by leaps and bounds, with totally new technologies becoming available for the first time. Despite the rapid growth, only a few choices are available.

Before you get into what's available, however, you should understand what it is you want to accomplish online. Do you simply want pictures (such as photographs) online? Do you want simple window dressing for your BBS? Do you want a full-function graphical interface for your callers?

The next thing you should think about when considering online graphics is whether the graphics technology is open or closed. An open interface is one whose methodology is published and available to anyone who wants to implement the interface in applications software. Open interfaces can be published standards, or they can be produced by a particular company or organization. Closed interfaces are not open for implementation, or they require licensing fees to be paid to the creators of the interface before it can be implemented by software authors in their applications. Needless to say, open interfaces are preferable; they offer the most likely possibility of being widely accepted and implemented. (Most of the technology popular in online environments started as an open standard, free for anyone to implement.) However, there's not much money to be made in doing all kinds of research and implementation on an open standard when anyone can simply take what you've done and use it. That's why some of the truly interesting things happening online at the moment are closed standards.

Of all the methods of handling graphics online, none have advanced to the point where all user needs are embraced and implemented within a single method or technology.

Many of the technologies I'll be describing later are *kludge* solutions—ones that involve trade-offs, or combine lots of pieces to achieve the result you're looking for. As I said, this segment of the online world is advancing at a record pace. More solutions will become available over time, and existing technologies will likely be expanded to include additional capabilities.

The bottom line is that if you want to implement any type of graphics online, don't expect a total, one-stop, well-integrated solution. Such a solution does not exist at this writing, and it is not likely to emerge quickly (if, in fact, it does at all). Also, don't expect to achieve any type of online graphics without some work on your part; sometimes, quite a bit of effort is required.

Image-Display Technologies

Image-display technologies include methods of showing graphic images online. They are not, and are not intended to be, full user interfaces (I'll discuss those later). Image technologies can be used in applications such as online shopping (where you want to display a picture of the various products offered) and databases (where visual, not just textual, representations of data need to be stored).

Image technologies and textual user interfaces are not mutually exclusive. Any BBS that can offer files for download can offer images online. The usability issues are on the caller's side of the connection. In most cases, you have to settle for allowing users to download the images as a file and display them off-line. Some terminal programs, however, can display images as they are being downloaded, offering a sort of graphical embellishment to some types of BBS applications.

GIF Images

GIF, the Graphics Interchange Format, was developed by CompuServe, a major commercial online service. GIF (pronounced "giff" or "jiff") is a file format for storing bitmapped images. Because GIF was developed by an online service, it has been embraced by many developers in the online world.

One of the benefits of GIF files is that software is available for a wide variety of computer platforms to display the images. Provided a terminal program can do a simple download, a GIF file can be downloaded by a user to his or her computer and displayed off-line using any one of dozens of GIF file-display utilities. Some terminal programs, such as Procomm Plus for Windows and Smartcom for Windows, offer a view while downloading feature that lets the user see the image in real time as it's being downloaded, making it an ideal solution for some types of BBS problems.

The view while downloading capability is even available for PC users running DOS. SHOWGIF, a shareware memory-resident utility, can be used with virtually any DOS-based communications program. SHOWGIF detects a download of a GIF file, places the computer in graphics mode, and displays the image as it's coming across the line.

The downside of GIF files is that full-screen GIFs tend to be quite large (often 100kb to 300kb in size, sometimes larger), especially if they contain large numbers of colors. By keeping images small, or by reducing the number of colors used, transmission times can be kept as short as possible. GIF also includes a feature called interlacing where the image is painted top to bottom very roughly, then filled in with multiple interlaced passes. This technique allows a caller who can display the file while downloading to see the image form more naturally than the normal, noninterlaced top to bottom method.

JPEG Images

JPEG (Joint Photographic Experts Group), like GIF, is a file format for the storage of images. JPEG images are compressed using complex algorithms. They are much smaller than comparable GIF images, and as a result are fairly attractive for online use. However, acceptance of JPEG is at an early stage in the online world. Although JPEG is popular in online UNIX environments, others have been slow to embrace it, so few utilities are available to handle the format. JPEG images feature *true color* support (true photographic-quality images), which makes the format attractive.

Many people expect JPEG to be accepted for online use within a few years. Look for the ability to display the images online to become more common. JPEG may also be integrated within online graphical interface methods (discussed later in this chapter).

Other Image-Display Technologies

In addition to the preceding methods, there are two popular proprietary methods for displaying images online.

The first, called Fracterm, is produced by Imagen, Inc., of Vancouver, British Columbia. Fracterm uses a unique fractal compression algorithm to reduce photographic-quality color images to between 5kb and 10kb each. Fracterm image display can be added to virtually any BBS, since the images are merely files stored on the BBS and downloaded by a user. A Fracterm-equipped user, however, sees the image paint on his or her screen during the download. The entire process is automatic. The Fracterm terminal software is available for DOS and Microsoft Windows platforms.

The second method, called DC Net, is produced by Durand Communications Network of Santa Barbara, California. DC Net is not only a mechanism for displaying image files, but is also a visual databasing system. The compression mechanism used by the product compresses photographic-quality images to between 8kb and 15kb each.

Interface Technologies

Interface technologies take the presentation of online graphics to another level. Instead of simply displaying pictures online, interface technologies embellish the system with things like system menus and text displays. They can range from simple enhancements to fully interactive systems.

The NAPLPS Standard

NAPLPS (usually pronounced as "napp-lips"), the North American Presentation Level Protocol Syntax, is a documented standard. In the United States, it's available as ANSI standard X3.64, and in Canada, as CSA standard T500. NAPLPS is over ten years old, with its early development even older. Because it's quite well established and documented, NAPLPS makes a fairly attractive platform for an online graphical interface.

NAPLPS has achieved some level of recognition through its implementation as part of the Prodigy online service. The graphical engine of Prodigy is NAPLPS; if you've seen Prodigy you've seen a live, working example of NAPLPS. (Prodigy also includes many other interface elements that are not directly attributable to NAPLPS, however, so Prodigy is not a pure example of the standard.)

Despite its age, NAPLPS can provide extremely high-resolution vector images that are highly compact in size. NAPLPS actually supports many different resolutions, called domains. The highest domains support screen resolutions much greater than even current technology can display directly.

One of NAPLPS' advantages is *device independence*, meaning that domain resolution is related proportionally to the screen resolution of the user, and that colors are rendered according to the capabilities of the user's screen as well. This effect allows NAPLPS images created on virtually any hardware to be accurately and reasonably represented on hardware either more capable or less capable than that of the creator.

The primary disadvantage of NAPLPS is that it's little more than window dressing. The standard defines methods for vector graphics to be transmitted to and displayed by a remote user. There is no accommodation, however, for such things as mouse support. NAPLPS was designed as a standard for *videotex/teletext* services, which are inherently noninteractive. At one time, many believed that would be the way in which people functioned online: noninteractively. As a result, no interaction provisions were designed into NAPLPS. Therefore, the best NAPLPS can do is to augment your displays online, making them graphical—in other words, window dressing.

The number of utilities for creating NAPLPS images is limited. In addition, few terminal programs offer NAPLPS support, and those that do are usually missing the niceties most modem users are accustomed to.

NAPLPS does not offer error-checking. As a result, you must use error-correcting modems to ensure that graphics displays are not corrupted by line noise or other connection anomalies.

The RIP Standard

RIP (Remote Imaging Protocol) is a relative newcomer to the online world. RIP picked up momentum in 1992 during the first ONE BBSCON conference for the BBS industry, where attendees were impressed with its capabilities. Today, RIP is showing signs of being the most widely accepted mechanism for providing an online graphical interface on a BBS.

One of RIP's advantages is its design. The RIP codes, called *RIPscrips*, are composed entirely of printable, 7-bit ASCII characters. This allows RIP to be implemented on any host software and used on any type of communications connection. Vector-based and highly optimized, RIPscrips are small and transfer quickly to a user's screen even at slower modem speeds. RIP's simple text-based formats make it easy to implement with virtually any BBS software, including those that have done nothing special to support it.

RIP provides support for a mouse; in fact, many of its features are designed with a mouse in mind. Its attractive buttons and icons allow users to click their way through the most cumbersome of menu structures. Unlike NAPLPS, RIP is truly interactive.

The icons RIP uses reside on the caller's computer, and they are not transmitted over the modem connection. This local storage of some parts of the presentation makes for very fast displays. The downside, however, is that a caller to your BBS must have copies of your icons before he or she can use your system. If the caller uses many different RIP-capable BBSs, the need to locally store thousands of RIP icons can quickly become tough to manage and has the potential to consume large amounts of disk space.

At this writing, limitations include a screen resolution and color palette that are limited by today's standards, roughly the same as an EGA video system on the PC platform: 640 by 350 resolution with just 16 colors displayable at one time (out of a total palette of only 64 colors). RIP does not offer niceties such as menu bars and pull-down menus, the staple of most of today's graphical interfaces (such as the Mac and Microsoft Windows offer).

Although RIP does support multiple fonts, they are limited to those offered by the protocol (a small selection of rather simplistic outline fonts). Finally, RIP does not have provisions for the display of image files, nor does it have any error-checking.

TeleGrafix, creator of the RIP protocol, has indicated its intention to continue development on RIP indefinitely and to add many of the features that users have been requesting. I recommend contacting TeleGrafix or your BBS software vendor to determine the current state of the RIP protocol. Although the commitment of TeleGrafix to the RIP protocol is good at one level, it's anathema for many software developers. For RIP (or any online graphics technology) to reach wide acceptance among users, it must be implemented by numerous software vendors. If the RIP protocol design continues to change at its current pace, developers will have a difficult time keeping up with it and may be unwilling to embrace the technology.

At this writing, however, RIP is showing serious signs of winning the online graphical interface battles, compromises or no.

Other Interface Technologies

There are alternatives to the graphical interface methods I've outlined. Most of these alternatives are closed interfaces, meaning that implementations of the graphical method are limited to the original designer and manufacturer (third parties are excluded). As I said previously, this limits their appeal to some degree. You should consider a closed solution only in situations where supplying your callers with a special terminal program is acceptable, or if the method becomes open and available to others.

Tel-FX is an online interface protocol for BBSs from Hamilton Telegraphics, Inc., of Aylmer, Quebec. Currently, Tel-FX is available only in RoboBOARD, a PC-based BBS product from Hamilton. Tel-FX is an impressive protocol, offering a variety of Windows-like interface features such as dialog boxes, input fields, scrolling lists, and more. Most striking about Tel-FX is its speed; even complex screens paint rapidly.

Coconet, from Coconut Computing of La Jolla, California, is a UNIX-based BBS package that has seen acceptance in some

circles. The graphics methodology it employs is proprietary (closed); your users are forced to use the end-user (client) software created by Coconut, which is available for PCs and Macintosh computers. (You can distribute this software to your callers free of charge.) Coconet features a combination of vector and bitmapped graphics abilities. In its early implementations, Coconet was simplistic in its presentation, but it's been expanded to include better graphics, as well as online sound capabilities.

FirstClass is a Macintosh-based BBS package from SoftArc of Scarborough, Ontario. This system requires callers to use end-user (client) software supplied by SoftArc, which is available for Macintosh computers and PCs running Microsoft Windows. It features icons, sounds, and on-screen forms. One of its most interesting features is its ability to multitask the online session, allowing you to enter messages or chat with other users while a file transfer takes place in the background.

Other Macintosh BBSs that offer graphical interfaces include NovaLink, developed by ResNova Software of Huntington Beach, California; and TeleFinder, from Spider Island Software of Irvine, California. Both of these packages require special end-user software, which is available only for Macintosh computers, limiting your callers to Mac users only. (ResNova has announced Microsoft Windows end-user software, but it was not available at this writing.)

Summary

After reading this chapter, you should have an understanding of the following:

- Although you can choose a single-line or multiline BBS, only multiline BBSs are viable for entrepreneurial and business systems.
- You can determine the total line count through the staged or estimated approach.
- Decide which platform you want to run your BBS on: PC, Macintosh, or UNIX are the three most common choices.

- Multinode software is the only way to offer true shell-to-DOS doors, and integrated BBSs have reduced hardware requirements and cost in most cases.
- You can analyze the cost of a BBS solution and compare the cost to other solutions by using the per-line cost figure for various line counts for each solution.
- Know the differences between commercial and noncommercial BBS software and which you plan to use.
- Know what a multitasker is, what the limitations on line count are, and why those limitations exist due to the general-purpose design of external multitaskers.
- Several methods exist to offer graphics in the online environment, including image-display technologies (showing pictures) and interface technologies (graphical interfaces online). You must take some limitations in terminal software into account in deciding to go graphical.

Worksheet 3: Choosing Basic Hardware and Software

Which type of BBS are you planning to run?

- ❑ Single line
- ❑ Multiline

If you want to run a multiline BBS, use either the staged approach or the estimated approach to figure out a conservative starting place for your system, the goal being to expand or contract this line count rapidly as your new BBS establishes a track record of user demand.

Your starting place using the staged approach is _____ lines.

To use the estimated approach to line count, estimate the following figures:

The *average* number of minutes you expect your callers to stay online per call:

A = _____

The *average* number of callers you need to service on a daily basis:

B = _____

The number of hours per day that your system will typically be used:

C = _____

Now use A, B, and C in the following formula:

((A ÷ 60) × B) ÷ C = _____ (estimated line count)

- ❑ If your values for A, B, and C are accurate and proven, use your estimated line count: ____
- ❑ Otherwise, use 25 to 50 percent of the estimated line count: _____

Which computer platform do you intend to use for your BBS?

- ❑ PC
- ❑ Macintosh
- ❑ UNIX

If you are using the PC platform, as most sysops do, which type of multiline software will you use?

- ❑ Multinode (true doors available, uses a multitasker or LANs for multiline)
- ❑ Integrated (no true doors available, uses internal multitasker and a single computer)
- ❑ Hybrid (no doors, very high line counts)

Calculate the per-line average cost for the various BBS products you're considering. (If you don't know which products you're considering right now, come back to this exercise later.) Refer to the Insider Tip on "Comparative Cost Analysis" as needed. First, make several copies of the template in Figure 3-5—one copy for each different combination of BBS products you are considering. Or enter

Figure 3-5
Partial template for comparative cost analysis

Lines	1	2	3	. . .
Computer				
Multiport hardware				
Modems				
Multitasking software				
BBS software (base)				
BBS software (upgrade)				
LAN hardware/software				
Operating system				
TOTAL COST				
PER-LINE COST				

the template into a spreadsheet program if possible. Be sure to include as many columns as the maximum number of lines you're considering, and write down what products each configuration includes.

To compare one product to the next, average the per-line costs for each product. You may also wish to compare the per-line costs for specific line counts. Print out your spreadsheets, and file a copy with your other worksheets for this book.

	Configuration	Average per-line cost
A:	_____	_____
B:	_____	_____
C:	_____	_____

Do you want graphics online? ❑ Yes ❑ No

If yes:

- ❑ Image display
- ❑ Complete graphical interface

Which online graphics solution do you intend to use? _____

Hint: Consult current trade publications for information on the latest graphics technologies.

4 Enhancing Your BBS Setup

In Chapter 1, I outlined the functions that a BBS provides. BBSs in operation today, however, are increasingly being asked (by users and sysops alike) to provide more functionality than standard BBS software is normally able to provide. Networked mail, online games, off-line readers, fax support, and much more are all things you might want to consider adding to your system.

Keep in mind that with few exceptions, these types of enhancements can be added at any time. You are not obligated to put these types of things online from day one. There might be some motivation to do so, however; if your situation means that financing these options later will be difficult, you might want to pick out what you need at the beginning. Software vendors may also offer you package deals, where you're able to buy some types of extensions at reduced cost if you buy them up front with your BBS software.

Buying BBS Add-Ons

Some BBS enhancements are made by the vendor of your BBS software. In other cases, they are created and sold by *third-party vendors*—someone other than you or the BBS software company.

In all cases, here are some things to consider when shopping for BBS enhancements:

- **Integration** How does the add-on integrate? You need to find out if the software is ready to use, or whether you must have source code to your BBS and the software, and recompile everything together.

- **Compatibility** Does it work with your BBS software? You may find an interesting and useful add-on, but if it's not designed for or compatible with your particular BBS package, it won't matter. Ask the vendor of the add-on. (Of course, with add-ons purchased from your BBS software vendor, this won't be a problem.)
- **Installation** What does it take to install the add-on? This is especially important once your BBS is online and running. If it takes several hours to get a package fully installed and implemented, that is time during which your BBS might be unavailable to your callers. In addition, find out if you need more memory to install the option. Determine what's required so you can plan accordingly.

Electronic Mail Networking

Electronic mail networking refers to the distribution of electronic mail between your BBS and other online systems. The technology allows users on your BBS to communicate with people on other systems, such as commercial services and business and educational e-mail systems, as well as other BBSs.

Networked mail has become a feature many users expect from a BBS. Networked mail has been available in various forms for several years. The tremendous growth of the Internet in the last couple of years, however, has created a groundswell of interest in networked mail, making it more popular than ever among BBS users and operators.

FidoNet Mail

FidoNet is the largest and oldest mail network devoted specifically to BBSs. The network was launched in 1984 when Tom Jennings, a San Francisco programmer, decided to add the capability to send networked messages to his Fido BBS software.

Initially, Jennings' Fido software offered only basic BBS functionality. It was when he discovered his long-distance phone bill

growing to unworkable proportions that he sought a way to cut his costs. Much of his money was being spent making long-distance calls to a friend's BBS. He knew there had to be a better way, so he designed a networking system for his BBS software.

The networking support he added was the implementation of a simple automated mail-transport protocol. Its file structures were based roughly on the message structure he used with his Fido BBS, and the messages were sent using a modified XMODEM file-transfer protocol that he called Telink. The system was designed to send messages automatically, unattended, in the middle of the night when phone rates were at their lowest. An address book was added, called a *nodelist*, and Jennings called his creation FidoNet. The name described both the mail delivery technology he devised and the network of BBS systems that resulted.

FidoNet became popular among the operators of the Fido BBS software, and the network grew by leaps and bounds. Over the years, various iterations of the protocol and changes to the network structure have taken place to keep up with the growth of FidoNet. Today, FidoNet is a collection of about 25,000 BBS systems around the world. FidoNet continues to grow at a steady pace.

Originally, FidoNet was used to pass person-to-person e-mail, called NetMail. A message was composed on the BBS locally and saved for later delivery. (This technique, called *store-and-forward electronic mail*, is used in many e-mail networks.) In 1986, Jeff Rush (a FidoNet member) developed a software package called EchoMail that echoed messages between systems in a bucket-brigade fashion. This allowed FidoNet participants to share entire message areas between systems.

Today, FidoNet implementations exist for many BBS software packages, not just Fido. In fact, virtually every BBS package available today has FidoNet support, either internally or available as an add-on (from either the BBS vendor or a third party). The FidoNet network has spun off several other networks; these other networks are separate from FidoNet, but they use FidoNet technology to communicate. In addition, many businesses use FidoNet technology in private networks for inter-BBS communication.

For hobbyist BBS sysops, FidoNet is worth a serious look, depending on your needs. It's an inexpensive way to add busy message areas to your system, so it looks busy even to a lone user. EchoMail areas—hundreds to select from on a huge variety of subjects—carry thousands of messages' worth of traffic daily. If you have friends who run BBSs, FidoNet is also a terrific, cost-effective way to communicate; simply send a message via the network instead of calling each other's BBS systems.

Entrepreneurial sysops may wish to consider adding FidoNet support. Like the hobbyist sysop, you'll likely be most interested in EchoMail areas that allow you to provide message areas on a variety of topics. The instantly busy nature of EchoMail areas gives your users the perception of a busy system even if you opened the door only yesterday.

Business sysops should pass on FidoNet as a network; it generally offers nothing of significant value to the business BBS. FidoNet technology, however, can work for you if you plan on starting several BBS systems at different locations. FidoNet technology allows employees at one location, for example, to communicate conveniently with employees at other BBS-equipped locations.

Hobbyists and entrepreneurial sysops can choose from FidoNet itself, or any of the various FidoNet-compatible networks in operation. The best way to locate these networks is by calling BBSs in your area. In most cases, public BBSs advertise the network(s) they participate in (if any). When you encounter systems running in a particular network, ask the sysop you meet about the networks they use.

FidoNet, as well as most FidoNet-compatible networks, are completely volunteer operations. They have no formal operating structure; they work and prosper from their own momentum and the commitment of the people who make up the informal management systems that govern such networks. Much of this is an outgrowth of Tom Jennings' own anarchistic views. The network to which he gave life continues just fine without any formalities imposed upon it, long after Jennings' departure.

This does make it difficult to join the network, since there is no place you can simply call or write for more information. The

process of learning more about and joining the network consists exclusively of finding by trial and error someone who runs their BBS on FidoNet. Once you've found someone, ask them for information about joining the network. The information you're usually after is the name and BBS phone number of the *network coordinator* or *regional coordinator* that covers your local area. With this information in hand, place a call to the BBS, leave a message to the sysop for information, and call back later for a reply. Many such BBSs also have information files posted with additional information.

To operate your BBS in FidoNet, you need the following:

- **Mail-handling utilities** These are made specifically for the BBS software you run. They are sometimes supplied by the BBS software vendor, but they may be supplied by third parties or shareware sources. Ask your BBS software vendor for more details.
- **FidoNet mailer** This is the software that connects your BBS to another FidoNet BBS on demand. It often can be a mailer of your choosing, but it is sometimes tied to the BBS software you run. Here again, ask your BBS software vendor for advice.
- **Nodelist compiler** This takes the FidoNet address book (nodelist) and converts it into a format that your BBS and mailer can use. Dozens of common compiled nodelist formats exist; check the documentation for your BBS and for your mailer to find out what nodelist formats are supported, and for advice on which compiler to use. Note that both your BBS software and the mailer need compiled nodelist files—they may be the same format, or they may be different (meaning you'll have to keep duplicates around).
- **Local help** FidoNet is complicated, and the lack of any formal structure makes matters worse when you run into trouble. There's nothing more valuable than having another sysop, someone in your local area who is the helpful sort, available to help you. You'll probably live through it on your own, but if you can track someone down who's willing to lend a helping hand (or at least explain things when you don't understand something), you'll be much better off.

FidoNet does not cost money, but the mail utilities, mailer, and nodelist compiler often do. Depending on where you are located, you may have to pay a small amount to receive EchoMail areas (shared public message areas), but since you pay for the telephone call that is used to send NetMail, no fees are involved with that.

Keep in mind that NetMail is virtually always delivered by the sender placing a call to the recipient's system directly, whether that call is local or long distance. FidoNet does not have formal structures in place for defraying your costs—you pay for that call (that's why FidoNet is offered for free). EchoMail, on the other hand, is handled by volunteers who together decided to help distribute it. Sometimes these people pay for the phone bill on their own; in other cases, systems in a particular area are required to chip in to receive any EchoMail. Ask your network coordinator (or the local contact you've established) for more information.

Internet Mail

Although the Internet offers many distinct functions, among the more popular and most used functions is Internet electronic mail. BBS operators are rapidly embracing Internet mail because of the unique benefits it provides. Unlike FidoNet's electronic mail feature (NetMail), which primarily BBS sysops (and not users) take advantage of, Internet e-mail is increasingly becoming a feature that BBS users look for when calling systems.

Internet is not a network itself; rather, it is a collection of educational, research, government, and corporate computer systems and networks. Because it incorporates all of these smaller networks and systems, the Internet is often referred to as a *metanetwork*. The participating systems are connected using an international web of high-speed data circuits. Internet is paid for by the systems that participate in it. The Internet provides four major categories of functions: remote login (*telnet*), remote file transfer (*ftp*), electronic mail, and newsgroups. (I'll talk about telnet and ftp in Chapter 6.)

Electronic mail is the most popular feature of the Internet. Since virtually all major electronic mail systems are connected to or have gateways to the Internet, messages can be sent via Internet

to nearly any electronic mailbox in the world. With Internet support, users of your BBS can send electronic mail messages to other BBSs, friends, or associates at educational institutions, electronic mailboxes on MCI Mail (one of the world's largest private e-mail systems), users of major online services such as CompuServe and America Online—the list goes on and on. Internet e-mail addresses, called *domain addresses*, are increasingly found on the business cards of high-tech individuals, testament to the network's popularity and wide accessibility. With the technology available today, you simply cannot obtain better e-mail connectivity than by having access to the Internet.

Newsgroups are the Internet's equivalent to FidoNet's EchoMail. Newsgroups are shared message discussions, each on a given topic. Thousands of newsgroups exist on an infinite array of subjects. Newsgroups have a tremendous level of participation, with more topics supported and wider usage than FidoNet EchoMail. Many BBS sysops are seeking out newsgroup support because, like FidoNet's EchoMail, it gives the perception of a busy system and a sense of community to even the smallest bulletin board systems.

Hobbyist sysops may shy away from Internet support, since it costs money to provide it in most cases. Still, even when there is a cost, it's usually quite reasonable. If you're looking for e-mail connectivity, it's hard to pass on adding Internet support to your BBS.

Entrepreneurial sysops will find that in today's competitive BBS marketplace, Internet support is a virtual must-have if you're attempting to make your BBS have wide appeal. Even if your BBS is focused on a given theme or topic, your users can likely benefit from Internet support, and you'll find numerous uses for it yourself (as sysop) too.

Business sysops may wish to consider Internet support for easy connectivity with company employees, suppliers, contractors, and so on. Many businesses already have Internet connectivity elsewhere in their organization; if so, adding support to the BBS may well be a necessity. Most business applications of BBS technology probably won't be interested in making Internet

access available to callers, instead reserving it as a feature for sysops and employees.

The Internet itself is interconnected by a network of dedicated data circuits that offer real-time electronic mail. This network is like a huge pipeline that is always pumping electronic mail (and other types of connections) from point to point, 24 hours a day. BBSs don't usually connect to the pipeline; rather, you connect in a store-and-forward manner to a system that is connected to the pipeline. It's much like backing a truck up to an oil pipeline to drop off or pick up a shipment—you do not remain connected at all times, but only when necessary.

Internet support is inherent to UNIX-based BBSs, which is one of the most compelling reasons to go with the UNIX platform for your BBS. For Macintosh- and PC-based systems, connections to Internet usually consist of the following:

- **UUCICO** This is the software that connects your BBS to the Internet. Mail is stored on your BBS and is forwarded to an Internet site on a scheduled basis. The UUCICO sends the mail to the Internet site, and picks up any mail that may be waiting for your system at the host. (UUCICO stands for *UNIX to UNIX copy in, copy out* and is pronounced as "yoo-yoo-kai-koh" or "yoo-yoo-see-eye-see-oh.")
- **Import/export utilities** These are software programs that translate between the UUCICO program's file formats and the formats used by your BBS software. This is how messages to and from the Internet get into and out of your BBS's message base, where you and your users can interact with them. Often, the utilities require a specific UUCICO, since UUCICO programs use varying formats. These utilities are available from either the maker of your BBS software or third parties.
- **UUCP host** This is your connection into the Internet. If you are a student or faculty member of a university, you may be able to secure UUCP access at no charge from your school's computer center. Occasionally, you may be able to get this access from your employer if your company has its own Internet access facilities. If you're not so fortunate, you'll have to buy the privilege from a commercial vendor. A variety of such resources are available; they simply need to

provide you with a UUCP dial-up connection. You may also want *domain name service* so your BBS can be identified by a unique host name. If so, ask your UUCP source for information on this service. (A list of some major Internet service vendors can be found in the Appendix.)

When you're investigating the Internet and adding support for it to your BBS, it's important to remember that you're working with a technology that is not inherently simple. Adding only e-mail in most cases is fairly straightforward, but in general, the Internet and the software tools that allow you to access it with a BBS are technical tools made by technical people primarily for other technical people. You may wish to spend some time talking to vendors both of software for your BBS and of Internet (UUCP host) access to get a feel for the depth and breadth of setting up and using the Internet from your BBS.

LAN E-Mail Gateways

LANs (local area networks) are a connectivity tool popular in business environments. Offering file sharing, resource sharing (such as printer sharing), and electronic mail, LANs help people work together and manage computer resources better.

Often, you may have a situation where you'd like to connect your LAN e-mail system to your BBS's e-mail system, so users of both systems can communicate. To implement such a scheme, you need a *LAN e-mail gateway* product.

Many issues are involved with setting up such a gateway. In order to work, the gateway software must know about your particular LAN e-mail system, as well as your particular BBS software.

LAN e-mail systems come in many varieties. Unfortunately, these systems use few standards, making them incompatible with one another, and making it difficult to create LAN e-mail gateways for BBS systems. One widely accepted LAN e-mail method is Novell's Message Handling Service, or MHS. Novell LANs are virtually an industry standard, being the most widely supported and widely implemented LAN system today. Most LAN e-mail gateways for BBSs are gateways between a BBS and Novell MHS.

If you are considering a gateway, begin by asking your BBS software vendor whether one is available for its software. The functionality is standard in some BBS packages. If a gateway is available, check compatibility with the LAN e-mail system you run in your organization.

If a gateway does not exist that can link your BBS with your LAN, you might consider another approach. Some organizations have used the Internet as a vehicle to link disparate e-mail systems. Although it involves many pieces, the basic scenario is that you set up Internet links for both the LAN e-mail system and the BBS, then pass messages via Internet between the systems. Of course, this indirect approach is hardly ideal.

Off-Line Mail Reader Support

Off-line mail readers are extremely popular among avid BBS users, and they are rapidly being discovered by occasional BBS users. The reasons are clear: Off-line readers are incredibly convenient and easy to use, and they can save both you and your users a lot of money by making message handling remarkably simple. Figure 4-1 shows the off-line mail-reading process.

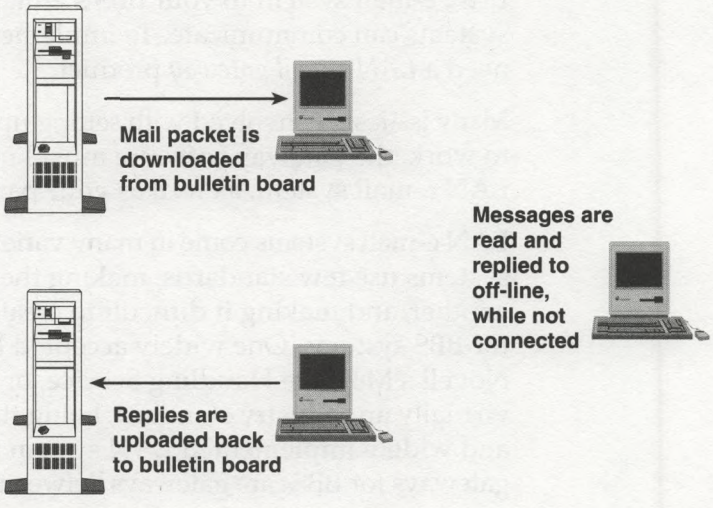
Mail packet is downloaded from bulletin board
Messages are read and replied to off-line, while not connected
Replies are uploaded back to bulletin board

Figure 4-1
The off-line mail-reading process

Off-line mail readers are easy to understand. First, you add support for off-line readers to your BBS in the form of a module (for integrated systems) or a door (for multinode systems). Some BBSs even come with off-line mail-reader support built in. Next, users who want to use the off-line mail system must be equipped with an *off-line mail reader* that is compatible with the particular type of reader software on your BBS.

Once this is taken care of, users can take advantage of the benefits of off-line mail. On the first use of the off-line mail feature on your BBS, a user selects which message areas he or she is interested in. These selections are saved on your BBS for subsequent connections, but users can change them at any time to add new areas or delete ones they're no longer interested in.

When selections have been made, the user issues a command to download all new messages. The BBS then scans the system for new messages (those not seen by the caller) and prepares all of them as a single file, usually called a *packet*. This packet is then downloaded by the user to his or her computer. Later on, while no longer connected to the BBS, the user can use the off-line mail reader to open this file and read the messages inside of it. If the user replies to any messages in the packet, they are saved to disk as a *reply packet*. This reply packet, which is also a single file, is later uploaded to the BBS, where the messages inside of it are distributed to the proper message areas on the BBS.

The advantages for the caller are clear:

- **Simplicity** Users are not required to use the message facilities on the BBS, which can often be cumbersome. Rather, they use the message-reading and -replying tools in the off-line reader software, which are generally more advanced. Even such features as a spelling checker are often available in off-line readers.
- **Convenience** Once a user has downloaded his or her messages from the BBS, they can be read at the user's convenience. If the user is distracted or has other things to do, most off-line readers keep a bookmark so the user can later pick up message reading right where he or she left off.

- **Cost savings** If users dial a BBS long distance, it can cost a significant amount of money to read and reply to messages, especially if the user finds numerous message areas interesting. Since messages are read and replied to off-line, without being connected to the BBS at all, most long-distance callers realize a significant cost savings by using an off-line reader. This is particularly valuable for technical-support BBSs, where it's likely that the majority of your callers are long-distance.

The benefits for you as the sysop are also significant:

- **Reduced connect time** Unless your callers are paying by the minute or hour to connect to your system, you probably want maximum dollars coming in for the least amount of connect time to maximize available resources. With off-line readers, message hounds who normally spend hours online every week reading and replying to messages can now come on, download a packet, and log off, increasing overall system availability.
- **Cost savings** If users are spending less time online due to off-line reader support, you can get by with fewer lines than you'd need otherwise. The users get the same level of service and the same features, but they take less time enjoying it online and therefore consume fewer resources.
- **User satisfaction** Probably the most important reason to provide off-line reader support is user satisfaction. Even if you charge by the minute or hour for access to your system (thereby making the goal to keep people online), you'll probably want to consider off-line reader support; it's a feature BBS users look for when deciding to subscribe to or use a BBS.

As I mentioned earlier, both the BBS and the user must use the same type of off-line reader format. By far the most popular off-line reader format is called *QWK*. QWK, which is derived from the name QuickMail, was the invention of Mark "Sparky" Herring, who devised the system for the PCBoard BBS software several years ago. Other developers came up with their own solutions as well, but only QWK has reached a high level of acceptance and support among BBS software vendors and BBS users alike.

QWK support is available for virtually every BBS software package. The QWK module or door is specific to the BBS software you use, since virtually every BBS uses its own file format for message files (and the QWK module or door must access these files).

For end users, QWK off-line readers are available for virtually every type of computer. Most readers are released as shareware and have modest registration fees. Since they're available as shareware, you can post several different readers on your BBS and let your users decide which one they like best. You can find QWK readers wherever shareware is available—other BBSs, online services such as CompuServe, shareware disk vendors, or computer user groups.

Document Search and Retrieval

An increasingly popular feature on bulletin board systems is document search and retrieval, also known as *hypertext*. This type of add-on lets you put a group of text files online and have users perform searches on these files. When a search is successful, the user can display the text file online or download it in some cases.

Document search and retrieval is perfect for any situation where you have a need to put large numbers of text files online for searching. Technical help notes, product information, trouble-shooting guides, manuals, and much more can be provided for easy access online using this type of add-on software.

When shopping for document search and retrieval tools, consider the following:

- **Single keyword or Boolean search?** Single keyword searches, as the name suggests, allow a user to enter a single word and search for that word within the text files you provide online. Boolean searches allow multiple-keyword searches to be performed, with logical separations. For example, a Boolean search might look like this:

  ((football and teams) not college) or basketball

A search like this would mean, "Give me all the text files that talk about football teams, except those that refer to college, or any text file that talks about basketball." Boolean searches offer significantly more flexibility, but the technology is more difficult to implement.

- **Fast searching?** Document search and retrieval is not very appealing or useful if search times are long. When you perform a search, how long does it take to search the entire catalog of files? Are search times slower during complex Boolean searches? Look for products that offer the fastest search times to maximize their utility online.
- **File handling options?** Document search and retrieval software should give you and your users several options for handling the text files in which searches were successful. Not only should users be able to display the file online, they should have the option of downloading the file as well. Some software has the ability to fax searched files too.
- **Configurability?** Ask how configurable the document search and retrieval software is. You should be able to reconfigure such things as command prompts and help screens to customize the software to your needs.
- **Capacity?** Most document search and retrieval software has limits on the number of text files you can search in one pass. If your software has limits, make sure the limits are liberal enough to meet your specific needs.

Fax Transmission

One increasingly popular feature on BBSs is fax transmission. This functionality has appeal for all types of BBSs.

In most cases, fax transmission software works in conjunction with faxmodems, which are modems with fax protocol support. Faxes are created on the BBS by the fax software, and they are then delivered via the faxmodem—usually a modem that's used on the BBS already. The faxes can be sent immediately or delivered later on a scheduled basis, depending on the fax software.

Like virtually all BBS extensions, outbound fax support is added with a door (on multinode BBS software) or a module (for integrated BBS software). On integrated systems, the faxmodem is sometimes located on a separate machine, which is connected to the BBS through a local area network (LAN). On other integrated systems, the outbound fax software blends with the BBS software and functions on a single machine.

Faxmodems usually adhere to special interface methods established by the Electronics Industry Association (EIA). One or the other of these methods, called *Class 1* and *Class 2* faxmodem interfaces, are offered in most modems sold today. The fax software uses these standards to communicate fax information to the modem. Not all outbound fax software for BBSs supports these standards directly. Rather, faxes are created with the software but are sent by an additional piece of software designed for the purpose. (Outbound fax support options for BBSs that work this way must use a second machine on a LAN or a scheduled BBS shutdown to deliver the faxes.) Some outbound fax software for BBSs, however, does use these standards directly and thereby offers a more seamless interface between the BBS and the delivery of the faxes.

Outbound fax support for BBSs can be used as follows:

- **User-generated faxes** This mode allows users to compose their own faxes, either by typing a message online or by uploading a text file prepared off-line. The resulting text is sent as a fax to a fax machine designated by the user. Entrepreneurial and hobbyist BBS sysops will be most interested in this capability.
- **Fax libraries** This mode allows users to select prepared faxes from a list and have the selected faxes sent to their fax machine (or to the fax machine of someone else). Business sysops will be most interested in this mode, as it allows technical help notes, product literature, service bulletins, and the like to be posted on the BBS and be made fax deliverable.

Setting up outbound fax capability on your BBS is a fairly simple endeavor. You need the following components:

- **Outbound fax software** This is the software that interfaces with the caller through a door or integrated module on the

BBS. It allows users to enter faxes online, upload a text file for fax delivery, and/or select faxes from a library for delivery.

- **Fax delivery software** If the outbound fax software for the BBS doesn't communicate with the faxmodem(s) directly, you may need this software. It interfaces with the faxmodem, instructing it on what is to be sent and how.
- **Faxmodem** This is a modem that offers support for fax protocols. This modem may be on your BBS (and used normally for incoming calls), or with some outbound fax systems, it may be on a separate computer that is connected to the BBS through a LAN.

INSIDER TIP. . . Inbound Fax Support

You may have caught on that so far, I've talked only about outbound fax support. You may be wondering about inbound fax support. Unfortunately, using today's technology, inbound fax support is not possible—or is at best unrealistic. Be wary of any BBS product or add-on that purports to offer inbound fax support. Here's why.

Several issues are involved with inbound faxing. First, you must understand that faxes are received by a faxmodem as a graphic image. Although the graphic image may contain textual information, the information is stored graphically, just like a picture, drawing, or photograph. Before it could be turned into text information for delivery to a BBS caller, it would have to be read and converted to text. This is accomplished by *optical character recognition* (OCR) software. Many software packages can accomplish this, but none of them are 100 percent accurate in their conversion.

Then there are other issues: What if the fax was handwritten? What if there are drawings or pictures along with the text? How are those converted to text? The answer is simple—they're not. OCR software can't interpret these elements, and they are discarded in the conversion process.

Of course, the incoming fax could be posted on the BBS for the recipient as a graphic image file. But for this to occur, you (or someone else in charge of the BBS) would have to view the fax image, determine who it was to, and post the file—all manually. BBS software that claims to offer inbound fax support usually implements it in a similar fashion. Assuming that a given fax was converted 100 percent accurately to text (which is unlikely), how could the text be forwarded to the BBS user it was intended for? If you or I actually read the file, it would probably say somewhere on it who it was for. Designing a software program to read the text and figure out where it says who it's for (if that information is anywhere on the fax), then matching that against the list of users on your system, is a virtually impossible task. If a BBS user named Robert Jones received a fax on your system, what would happen if it was addressed to Rob Jones? Or R. Jones, Bob Jones, Bob J., Rob, Bob, Robbie Jones, Mr. Jones, Bobby Jones?

All these names may refer to the same person, but how would an automated software package (or even you) know which user on your BBS the fax goes to?

For all of these reasons, seamless inbound fax support is simply not technologically possible today (nor is it likely to be possible anytime soon). Some BBS products or add-ons advertise inbound fax support. Such solutions are either unreliable or involve a great deal of manual intervention on your part. Don't be misled by advertising claims; inbound fax support for your BBS simply does not exist in a 100 percent automatic, 100 percent reliable fashion.

Graphical Technology Support

As I discussed in the preceding chapter, you may wish to implement a graphical interface on your BBS to make the system more attractive and easier to use. Some BBSs (especially Macintosh-based) come with graphical interfaces standard, but many BBS software packages have this capability available as an add-on package.

It's best to contact the vendor of your BBS software to find out if graphical interfaces are possible with that product, and if so, how such interfaces might be implemented. Are the add-ons available from the vendor, or from third parties?

Regardless of where you find such software, be sure to determine in advance what level of support is provided. Find out if you can make changes to the designs provided, and if so, how those changes are made. You should also make sure to ask whether all areas of the system are made graphical through the use of the add-on. Many current add-ons for graphical interfaces are only partial in their scope, and they do not make your entire system graphical. They may be limited in other ways as well.

When shopping for this type of add-on software, look for the following items:

- **Image-creation software** This is a paint or drawing program used to create graphical screens and menus for the BBS. Often, this software is cumbersome. If possible, try out the software before you spend your money, or ask other sysops how successful they've been in using the software.

- **Image-conversion software** This is a program (or a series of programs) that allows you to convert images from various common graphics formats to the format used by the graphical online interface. Since most graphical interfaces for BBSs use vector-image formats, these conversion programs are usually for converting from vector draw formats such as CorelDRAW! or HPGL.
- **Language or prompt module** Some BBS software features replaceable modules that contain system prompts. Often this capability is used for multiple-language implementation, but it can be used to change text prompts on the system to graphical equivalents. If your software has such a module, or if its prompts can be reformatted in some other manner, determine whether the add-on you're buying has this included or whether you have to make the changes on your own (usually a laborious task).
- **Menus** If your BBS software has configurable menus, find out whether the add-on software comes with ready-to-use graphical menus. Sometimes these menus can be used as is, but they are usually provided only to serve as examples for you to create your own.
- **Terminal software** Graphical interfaces require special compatible terminal software for the end user. Find out whether the add-on comes with terminal software that you can give or resell to users of your BBS. If it does not, you may need to hunt for a source for this software on your own.

Take the time to fully research the capabilities of the package you're considering. Ask other sysops who've used the product how difficult it is to set up and use, and whether everything required for the job is included. Time spent doing this research now may save you from wasted time and money later on.

LAN Login Support

If you operate in a local area network (LAN) environment, you may wish to consider adding LAN login support. This support

allows workstations on your LAN to log into the BBS via the network connection, rather than through a modem or other serial connection.

Note: LAN login support does not pertain to multinode software. Users of multinode BBS software can log into the BBS by running a copy of the BBS software from their workstation (either on their local hard disk or from the server).

LAN logins can be supported in many ways. Novell LAN environments offer IPX/SPX; an interface called an Int 14 hook; or emulation of a NASI/NACS asynchronous server. These techniques are covered in more detail in Chapter 6.

Data-Switch (Gateway) Support

Many BBS vendors offer data-switch or gateway add-ons. These enhancements for your BBS allow a user on one line of the system to be patched to another line. A user can thus connect outward to another system. In most cases, any type of connection supported for inbound calls can be used for outbound calls, including modems, hard-wired serial lines, X.25 circuits, and so on. Figure 4-2 shows the BBS being used as a gateway to another computer.

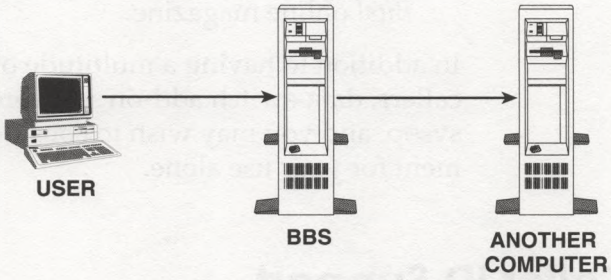

Figure 4-2
A typical online session through a BBS data switch (gateway)

For sysops, data switches are a convenience item. They allow you to use a line on the system to dial out to another system without having to take the BBS off-line. You may wish to allow users to connect through a serial line to another machine to run

programs (providing gateway doors, discussed in Chapter 3). In business settings, data switches can be used to access minicomputers or mainframe computers for remote access via the BBS.

When looking at data-switch software, determine if the following functions are offered:

- **Console use (integrated BBSs only)** Are you able to use the data switch from the machine on which the BBS is running? This allows you, in essence, to use the BBS as a terminal program without taking the system off-line.
- **Connection types** Are all types of connection supported? For example, can you use a hard-wired serial line, or are modem connections the only type supported?
- **Scripting** Does the data switch provide scripting capabilities so you can automate user connections to other systems? Is there adequate security and control provided to prevent users from dropping out of the script to dial any phone (anywhere!) they wish?
- **Time-out** Does the data switch provide an inactivity time-out to disconnect a call after a certain period of nonuse to prevent a user from jamming lines for extended periods doing nothing?
- **Automated script invocation** Can the data switch be configured to come alive at a predefined time to run a script? This is often handy for routine dial up and download tasks, such as grabbing the latest issue of *USA Today Decisionline* or *Eeeek Bits!* online magazine.

In addition to having a multitude of applications for use by your callers, data-switch add-on software can be valuable to you as sysop, and you may wish to consider obtaining such an enhancement for your use alone.

Caller ID Support

Caller ID is a mechanism by which the identity of a telephone caller is sent electronically by the telephone company as your telephone rings. Caller ID equipment listens to the telephone line

in between rings. It's during this time that electronically coded information is sent, which provides the telephone number of the calling party, and optionally provides the name of the caller. This information is normally used by a caller ID display unit that attaches to your telephone and displays the phone number and name on a small display screen.

Caller ID is not available in all areas. Contact your telephone company to determine if the service is offered where you live. There is usually an installation charge when you order this extra service, along with a monthly fee to maintain the service. Caller ID equipment is purchased separately.

Many modems are beginning to support caller ID internally. When a call comes in on the telephone line to which the modem is attached, it captures the caller ID data.

With the advent of this support, software add-ons for BBSs have been created that can use this information. This is potentially valuable information for sysops: You'll always know the telephone number (and optionally the name) of people who call your system. Should someone cause you any grief, you'll know exactly who they are.

In fact, stating to callers in your logon bulletin or screen that you have caller ID support is enough to scare away many potential troublemakers.

Caller ID support must usually be implemented as part of the BBS software or as an option that integrates tightly and directly with the BBS. The following functions can be addressed with caller ID support (note that these functions can be, and often are, combined):

- **Audit trail** The caller ID support option records all caller ID information, much like an adding-machine tape contains a printed copy of all computations performed on the machine. This simple mechanism allows you to match up logins to your system against the audit trail to trace who really called and when. If there's a troublemaker, you can backtrack to find out who it was.
- **Qualification** In most areas, callers can opt to suppress their caller information when they place a call. Qualification lets

the BBS disallow calls from people who have suppressed their information.

- **Automated login** With this function, caller ID data is used to automatically log a caller into the BBS.
- **Matching** This function matches caller ID data with the data stored for a particular user. If the information doesn't match, it is assumed that the caller is not who he or she claims to be, so is not allowed to continue with the session. This is undesirable in most cases, as it disallows people from calling from any telephone except the one that matches the stored data.
- **Display** This function shows callers their own caller ID information to alert them to the fact that you know who they are. The intimidation factor is what's in operation here, helping to scare away those people who might want to cause you problems.

Although caller ID data reporting is standardized within North America, how the data is captured and manipulated in a modem is hardly standard at all. As a result, caller ID software for BBSs is usually tied to a particular modem, or a limited selection of modems. To make matters worse, few modems have any caller ID support at all.

Someday, modem manufacturers may agree on how to implement caller ID methodology. Until that happens, however, it's unlikely that caller ID support for your BBS is a viable option for you, unless you don't mind being forced to use a particular brand of modem. If you choose to add this support to your system, check with the software vendor to see what modems are supported.

CD-ROM File Library Support

Among hobbyist and entrepreneurial BBSs, downloading shareware and freeware applications and utilities is often a huge draw for customers. BBS sysops are increasingly looking to CD-ROM–based file libraries as a way to post thousands of files on a BBS with little or no effort. A cottage industry has arisen to supply sysops with CD-ROM–based collections of such files.

CD-ROM based file libraries are problematic, however, especially for BBSs that run on integrated BBS software. The reason is that CD-ROM drives are extremely slow, on par with a floppy disk drive. When a BBS user is accessing a CD-ROM drive to download a file, the entire system can slow down, leading to unhappy users who find the jerky responsiveness of the system annoying.

BBS software is getting better able to handle CD-ROM access. With current technology, the best way to solve this problem is with add-on enhancements, which address the issue in various creative ways. These solutions generally fall into the following categories:

- **Copy before download** With this type of solution, add-on software fields requests from users to download files from the CD-ROM. The program then copies the files from the CD-ROM to the hard disk, where they are then downloaded. Since the impact of the CD-ROM occurs all at once (instead of throughout the file download) the net system impact is reduced. This is the least effective of the various solutions.
- **Peer-to-peer LAN copy** This type of solution employs a CD-ROM server, which is a computer dedicated to the CD-ROM drive(s) that is connected to the BBS's computer via a LAN (usually an inexpensive peer-to-peer LAN). The add-on has two parts. The first part runs on the BBS and fields download requests from the users. The second part runs on the second computer and interacts with the BBS's program via the LAN. Files that a user wants to download are copied to the BBS's hard disk and are downloaded from there by the user. Since the impact of the CD-ROMs is off-loaded to the second computer, the BBS suffers no degradation. This is probably the most effective solution to the CD-ROM problem.
- **Full-blown LAN** A full-blown (not peer-to-peer) LAN can also be used to handle the CD-ROM problem by connecting the CD-ROM drives to a dedicated LAN server. The BBS accesses the CD-ROM files from the server, using the regular download facilities of the BBS software itself. Because a LAN server has facilities to improve all types of disk I/O (including CD-ROMs), the impact of the CD-ROM drives is almost completely eliminated. This is also a good solution to the CD-ROM problem, but it should be reserved for those sysops who already have a full LAN at their disposal.

System-Analysis Tools

Most BBS sysops have an interest in knowing how their systems are doing. This is of particular importance to entrepreneurial and business sysops, who require statistical information to know whether they need to expand their systems. This is the function provided by system-analysis tools.

Occasionally, system-analysis tools come with BBS software. Most of the time, however, such tools are available as separate add-on options.

How system-analysis tools work varies from BBS product to BBS product. However, most of the tools report the same types of information:

- **Usage statistics** This is information about how many people used your BBS, when it was used, what your peak usage times were, how long lines were busy, and so on. You can use this information to gauge the success and effectiveness of your BBS, as well as to find out when it's time to add more lines to the system.
- **User statistics** This type of information concerns your users. Data is produced on a user-by-user basis, such as time online, how many bytes were downloaded, and so on. In most cases, this data is sorted so you can identify the top downloaders on your system, the top callers, and so on.
- **File statistics** This is information about file transfers on your system. This data is usually sorted as well, so you can determine what files on your system are the most popular.

When you're looking at system-analysis tools, search for tools that run quickly and are full-featured. In many cases, these tools work slowly; if they're run when your BBS is off-line, then the longer it takes for a particular tool to run, the longer your BBS is unavailable to callers. Further, look for analysis tools that offer the widest variety of features and statistical output.

Online Shopping

Business and entrepreneurial BBS sysops may wish to offer some sort of online catalog and ordering system to allow users to shop for items online. For business BBSs, this usually consists of the products sold by the company operating the BBS. Sysops of entrepreneurial BBSs often augment their income by selling various types of items online, sometimes focused on the theme of the BBS, often not.

Online shopping is popular on major commerical online services. Generally, however, it's not profitable on BBSs. The BBS should be viewed as an alternative ordering method for a more traditional overall selling operation. If you're going to sell merchandise, offer it through conventional means (mail order, phone order, retail, and so on), and let the BBS take its place as merely one more way for your customers to do business with you.

Another type of online shopping that is becoming popular is being an agent for another company. Your BBS offers the ability to browse and order products online, but the merchandise is being sold by someone else who is responsible for order processing and fulfillment. Companies that operate this way generally have their goods for sale on many different BBSs, maximizing the exposure and profit potential of selling online. Sometimes you are given a cut of the sales made through your system; in other cases, you simply offer the sales tool as a convenience item for your callers and make nothing yourself. Proceed with caution; sales transactions that go wrong can end up reflecting badly on your BBS, even if you weren't personally involved with the transaction.

Online shopping can be implemented on a BBS in a variety of ways. Some BBS sysops have done it by offering product listings and descriptions as text online, then having users leave messages to place an order. Others have used the information-gathering (questionnaire) facility available in most BBS packages to provide a simple ordering system.

The optimal way to provide online shopping, however, is to use software designed for the purpose. Most integrated BBS packages have modules available for this purpose; a door would be used on multinode BBS software. Select the software to use carefully, and look for these features:

- **Ease of use** The object is to invite people to buy, not chase them away with an ordering system that's difficult to navigate and use.
- **Payment options** Make sure the sales program offers a variety of payment options, and can handle paperwork and so forth appropriately (such as processing credit-card orders immediately, while holding orders paid by check until payment is received).
- **Completeness** Is the software a complete ordering system, or is there still a great deal of work you have to do manually? Avoid systems that make you reenter information later on.

Online Games

Online games are entertainment applications that users of your BBS can dial in and play while they're online. Business sysops can skip this section; it's fairly rare (if ever) that a business BBS will want to have online games. Hobbyist and entrepreneurial sysops, read on—depending on the focus of your system, you may want to consider online games.

Contrary to popular belief, online games are not always the haven of the teen and preteen set. More esoteric online games have great appeal among older BBS users too, and in many cases represent a real draw for callers. Although it's best to stick with the theme you've chosen for your BBS, many BBS sysops have found that the addition of online games, otherwise inconsistent with their primary focus, draw callers and keep them online (a good thing for most subscription-based systems). Online games don't really have to be consistent with the theme of your BBS; having them available is not unlike a restaurant or drug store having two or three video games available on their premises.

Like video arcades, some BBSs focus exclusively on entertainment online. With other BBSs, it's simply a fun diversion from the main focus of the system.

Online games come in two forms. Traditional online games are by far the most popular. With these applications, the game is a program that players run while they're online and connected to the system. On multiline BBSs, the games are single player or sometimes are interactive multiuser games where, with more than one user online playing the game at once, there is interaction between the various players. These types of games are limited to whatever interface the BBS has, which usually means they are text-based and lacking embellishments such as high levels of action and color graphics.

The second type of online game uses the BBS as a data pool. The game is built into the software the caller uses to dial the BBS, a sort of game and terminal program all in one. Once a connection is established, a facility on the BBS interacts with the user or allows multiple users to interact with each other. These types of online games usually feature elaborate graphical interfaces for the player. In this regard, they're just like regular computer games—they just use the BBS as a data clearinghouse and connectivity handler for multiplayer games.

Online games are implemented one of two ways, which correspond to the type of BBS software in use. For integrated BBSs, the game is written for specific BBS software. If you have an integrated BBS package, then you are limited to games which are designed and sold to work with that software (you cannot use games for other BBSs). Contact the BBS software vendor for information on developers who create such games. Because developers of these games must make a significant investment in software to write games for a particular BBS package, online games for integrated BBS packages are usually sold commercially by mail order. Few shareware or freeware online games exist for integrated BBSs.

For multinode BBS packages, online games are implemented as doors. Because doors can be made to work with a variety of BBS packages (and hence a wider market) a wider selection of online games is available for multinode BBS software. Since many

multinode BBS packages are released as shareware, online games for multinode BBSs are usually released as shareware, too (though there are exceptions). Although many good quality, popular online game applications exist that run as doors, the reliability and value of such programs is not consistent. Ask other sysops which games have proven themselves as good, reliable choices.

Finally, remember to register shareware with the author if you and your users are enjoying and using the program.

Callback Verifiers

Callback verifiers are a mechanism by which callers are verified by having the BBS call them back via modem. Callback verifiers operate in one of two ways.

The most common type of callback verifier is one that, as part of the new-user verification process, accepts a phone number from the user, hangs up, then calls the user back at that phone number. If the connection is successful, then the user's telephone number has been positively established. The assumption is that a user who is willing to release his or her real phone number is likely to have given all other information accurately as well.

The second type of callback verifier is one that calls the user back on every call to the system. In some types of business environments, this is desirable to ensure that a particular user is always calling from a particular location. This type of callback verification is rarely used among bulletin boards.

Common callback verification, performed as part of the new-user process (usually on hobbyist BBSs) is mostly ineffective. An accurate telephone number does not ensure that any other information has been provided accurately. Most telephone companies will not identify the owner of a particular phone number except to law enforcement officers, so it's unlikely that the possession of a caller's accurate telephone number is useful if you find out that the rest of the information the caller gave is wrong. Callback verifiers offer little more than a false sense of security.

That said, most callers who intend to do harm to your system or to be annoying online are unlikely to want to provide their accurate phone number. For this reason, callback verifiers will weed out at least some obnoxious callers. It will not prevent them all from getting online, and it should not be depended upon to do so.

Entrepreneurial sysops should avoid callback verifiers. Anything that serves as an annoyance or a barrier to getting online is likely to cause at least some people to give up on your system. If your goal is to make money with a BBS, you want people to be able to use your system easily and without being intimidated. The barrier that a callback verifier puts up adds needless difficulty and intimidation to the process of getting started with your system, doing more harm than good.

Callback verifiers are most often implemented as shareware doors for multinode BBS software. Some integrated BBS software packages offer the functionality, but not all. As is the case with most doors, several programs may be available that will work with your BBS software. If you choose to use one, check out the various programs available and select the one that functions and suits your needs best.

Chat Enhancements

If you're an entrepreneur, you may well be considering offering teleconferencing, or chat, on your system. Most BBS software comes with chat capabilities built in. However, the built-in chat of some products may not be adequate for a social BBS that depends on chat as a central focus for the system. Users of such systems often look for enhancements such as chat linking with other BBSs, ways to customize chat settings, and so on.

For these and other reasons, you may wish to consider a chat enhancement add-on for your BBS. When looking at this software, consider the following types of enhancements:

- **Chat linking** To connect the chat section on your BBS to the chat section on another BBS, you use a mechanism called *chat*

linking. If you have a friend or associate who is a sysop across town or across the country, you may wish to link your chat sections periodically and give users of one system a chance to meet and communicate directly with users of the other system. Some BBSs schedule chat links with various systems on a rotating basis. If you look at chat linking, does the linking connect only the public conferences, or can private chats be had through the link? Are "Who's Online?" commands connected through the link as well? Can you link to other BBS software, or only BBS software the same as your own?

- **Private chat improvements** Look for chat facilities that allow users to type to one another directly when two users are chatting privately with one another online. This is often called *typing mode* and lets the two users see each other's typing as it comes across the line, rather than being queued or buffered the way public chat normally is. (Some BBSs offer typing mode for private chats of more than two users; such a capability isn't practical and shouldn't be considered a selling point.)
- **User hosted conferences** This allows a user to create his or her own conference online and to invite others to participate. This usually means that the user can exclude those people he or she doesn't want to participate.
- **Profiles** Although profiles are in many respects a function separate from chat, some chat systems and enhancements include the capability of having a mini bio or *profile* for each user. This is primarily of value to systems that actively encourage matchmaking via the system.
- **Configurability** Some chat enhancements offer users the option to configure their own preferences for chat. In fact, some chat enhancements offer nothing other than configurability enhancements for the chat included with the basic BBS package. Configurable items include such things as colors used in chat, whether typing mode is active, and how certain items in chat are displayed.

If you'll be offering chat on your BBS, you should spend some time using existing chat systems to familiarize yourself with how the chat modes of various software work and what users like and dislike. You'll find that chat systems and enhancements are

subjective, with users in one city or region loyal to one type of chat, and users in another area preferring something entirely different. Often these prejudices affect how popular and successful your chat facilities are; in some cases, you may wish to reconsider your BBS software decision so you can provide the chat capabilities users in your area may be looking for.

File-List Generators

If you offer file downloads to your callers, you should strongly consider the use of a file-list generator. This add-on utility is designed to generate a master file list—a complete text listing of all files available on your BBS for downloading by callers.

Since file-area mechanisms vary from BBS to BBS, the file-list generator is tied to the particular type of BBS software you use. Sometimes file-list generators are provided with your BBS software, but they're usually created by third parties.

File-list generators are fairly simple and straightforward. When you're shopping for one, simply ensure that it operates with your particular BBS software and that it supports all of the various file features of the BBS.

Archiving Utilities

If you have been using BBSs for any period of time, you're already familiar with archiving utilities. If you're new to BBSs, however, you'll need to understand these utilities and have the most common types in your possession.

Archiving utilities all perform roughly the same functions: archiving (storing several computer files together) and compressing (reducing the disk space taken by the archived files).

Archiving utilities came about largely due to the influence of BBSs. Once file downloading capabilities came to bulletin boards, it

rapidly became obvious that there were some drawbacks. For example, what if someone wanted to post a computer program on a BBS, but the program has various data files and documentation files that went along with it? Before archiving utilities became popular, all the various files for the program would have to be uploaded and downloaded separately, and stored as separate physical files on the BBS.

Once these utilities arrived, however, life got much easier for sysop and user alike. An archiving utility could be used to gather the various files into a single file. A user could then download the single file, and by using the same archiving utility, could unpack the files—separate the archive into its original separate files and use them.

Compression algorithms were added to archiving utilities not long after their introduction. They increased the appeal of the utilities, since the archived files took less disk space for a BBS to store. Because the files were smaller, they also took much less time to download, which back in the days of 1,200bps and 2,400bps modems had particular value for everyone involved.

Archiving utilities are today critical for BBS sysops and users to understand and use. Virtually all are available as shareware. I recommend you keep copies of all the major archiving utilities on hand. Look to other major bulletin boards to obtain copies of the most popular utilities.

Archived files are identified on BBSs by a file extension in most cases. For PCs, the most common archiving utilities and their file extensions are as follows:

Extension	Program(s) Used to Create or Unpack
.ZIP	PKZIP/PKUNZIP, PAK
.ARC	ARC, PAK, ARC Plus, PKPAK/PKUNPAK
.LZH	LHARC, LHA
.LHA	LHARC, LHA
.PAK	PAK
.ARJ	ARJ
.ZOO	ZOO

On the Macintosh, the most popular are as follows:

.CPT	Compact Pro
.DD	Disk Doubler
.SIT	StuffIt

Note: Since Macintosh computers do not use the concept of file extensions, as DOS machines do, these file extensions are not always used on files archived with the respective utilities.

Time Bank

A popular feature of some BBSs, mostly hobbyist, is the time bank. This is implemented as a door or module for the particular BBS software you run. The general concept of a time bank is simple to understand. Users can deposit excess system privileges (usually per-call time remaining for the day) into the time bank. On a later call, when they need more time than they're ordinarily allowed, they can withdraw the additional time they need from their time-bank account.

Time banks make the most sense for hobbyist systems, but often an entrepreneurial system can take advantage of the capability as well. Users enjoy time banks for obvious reasons: They can save up time when they don't need it and use it later when they want it. When looking at time bank software, consider the following:

- **Allowable deposits** Some time banks are sophisticated and allow a user to deposit or withdraw various types of system privileges, such as call time, download privileges, access privileges, and so on.
- **Configurability** You should be able to set deposit, withdrawal, and balance limits to keep users from abusing the time bank to gain excessive amounts of time at a later date.
- **Ease of use** Many time bank programs are confusing for callers and are difficult to use. Select one that's easy and intuitive to understand and use.

Summary

After reading this chapter, you should have an understanding of the following:

- Many enhancements are available for your BBS beyond basic BBS functionality, from both BBS software vendors and third parties.
- Popular available enhancements include mail networking, off-line mail reader support, fax transmission, document search and retrieval, graphical technology support, LAN logins, data switches, caller ID, CD-ROM file library support, online shopping, online games, callback verifiers, and chat enhancements.

Worksheet 4: Enhancing Your BBS Setup

Consider which (if any) add-on software is appropriate to your situation.

Enhancement	Needed?	Available for My BBS?	Source	Cost
FidoNet mail networking	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Internet mail networking	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
LAN e-mail gateway	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Off-line mail reader support	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Document search and retrieval	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Fax transmission	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Graphical technology support	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
LAN login support	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Data switch (gateway)	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Caller ID	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
CD-ROM file library access	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
System-analysis tools	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Online shopping	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Online games	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Callback verifier	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Teleconference enhancement	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
File-list generators	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Archiving utilities	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____
Time bank	❑ Yes ❑ No	❑ Yes ❑ No	❑ BBS ❑ 3rd	_____

5 Buying Your BBS Equipment

By the time you reach this chapter, you should have a good understanding of what you want to accomplish by running a BBS and what tools you need to reach your goals.

This chapter is designed to cover the various aspects of buying the components that make up your bulletin board. It begins by covering the selection and purchase of the hardware for your system, with particular emphasis on serial port hardware. Modems are also covered in detail.

The chapter rounds out with coverage of BBS software buying, followed by an explanation of LANs and their various components.

By the end of this chapter, you should have the knowledge and understanding you need to start writing checks and putting together the various elements of your new BBS.

A Few Words About Buying

If you're lucky enough to have deep pockets, chances are you're quite comfortable spending money. For most of us, however, making high-ticket purchases is not an everyday occurrence. This section is designed to acquaint you with some important things you need to know when buying the various pieces of your BBS:

- **Use a credit card** Even if you have cash available for your purchases, I recommend you consider using a credit card to make all of the purchases (especially mail-order purchases) for your BBS. Primarily, the reason is so you can protest a

particular purchase should you feel you've been the victim of fraud or misrepresentation. Federal law protects credit-card purchases and provides several tools you can use to your benefit. If you buy something with a credit card, and the merchandise you have purchased does not live up to what you were promised when you bought the product, you can file a report with your credit-card issuer protesting the charge. The merchant must then accept the product in return and refund your money, prove that the charge is valid and that the terms of the purchase have been met, or otherwise settle your claim. Moreover, many credit cards offer automatic warranty extensions and other protections that may benefit you as well.

- **Liberal return policies** Make sure you can return what you purchased if you're not happy with it. This applies to both hardware and software. Purchase your products from a vendor that will accept the products back, and ask *before* you buy what the return policies are. Although sometimes you may not have a choice, avoid buying from sources that will not accept returns.
- **Check each vendor's reputation** If you've not heard of a particular vendor, be sure to check it out. Contact the Better Business Bureau in the area the company is located (or your local BBB). The state attorney general's office in the state the company is located can also provide information in some cases. If the company has a negative track record with either the attorney general's office or the BBB, avoid doing business with it or satisfy yourself that its problems are in their past.
- **Check out warranties** Where applicable (usually only hardware) ask about warranties before you buy. As the computer industry gets more and more competitive, liberal warranties are one way some vendors are trying to be more competitive. Remember, warranties are only as good as the company behind them. If you don't recognize a particular company, or if a company hasn't been in business long, chances are its warranty isn't going to mean much.
- **Ask around** People who are seasoned sysops are an invaluable source of information. Some sysops may view you as their competition, but many more won't and will happily

speak with you about their experiences. The annual ONE BBSCON trade show is a terrific networking opportunity for the sysop-to-be, as are the support BBSs operated by all the major sources of bulletin board software. You might also spend some time getting to know sysops in your local area. Some BBSs even have special forums (message areas, file areas, and so on) specifically for area sysops. Take the time to ask other sysops about their experiences with particular vendors, especially vendors of BBS software add-ons.

Selecting and Buying BBS Hardware

Running a BBS is unlike running any other type of software. Most people use their computer only occasionally, but a BBS is usually running 24 hours a day, 7 days a week, month after month, year after year. If you had to drive your car 24 hours a day, you'd probably look for the most rugged car you could get so you wouldn't suffer breakdowns or failures that would keep you from driving. You might look for other things, too. Selecting hardware for a BBS is not entirely unlike finding a car that will stand up to 24-hour-a-day use. The computer you pick for your BBS needs to be ready to stand up to constant use.

Picking Your Computer

What kind of computer you buy is decided by the BBS platform you've selected. Generally, you'll be choosing from an IBM PC or compatible, a Macintosh, or some type of system capable of running UNIX (such as a high-end workstation system).

Since most BBSs run on a DOS-based PC, an IBM or compatible is likely to be the type of system you'll be looking at. You may have a computer available for the job already; you can often run a reasonably sized BBS using an old AT-class (286-based) PC, or even a now-ancient XT-class (8086/8088-based) PC. Check with your BBS software vendor to determine the minimum requirements for the BBS configuration you're looking at. In most cases, you want at least a 386-based PC if you're purchasing new equipment.

Macintosh BBS sysops will of course need an Apple Macintosh computer. Macintosh computers, like their IBM-compatible counterparts, are available in a wide range of power and price. Here again, ask your BBS software vendor for advice on ideal computer selections.

If you'll be running a UNIX-based BBS, you can often run your system on an inexpensive 386- or 486-based IBM-compatible PC. However, depending on the particular flavor of UNIX (or UNIX clone) you run, and what BBS software you select, you may need something significantly more powerful, such as a workstation system. Seek advice from the vendor of your BBS software.

Price vs. Performance

Often, a particular BBS configuration requires a certain hardware configuration. For example, you may need a 486-based PC with 8Mb of RAM (or more) to handle an 8-line system using multi-node BBS software. If you already know you need a special combination of hardware, then the only criterion upon which to shop is price—finding the best price for the hardware you need.

In situations where you have more flexibility to pick and choose what you want, computer equipment is not entirely unlike anything else; you can usually get better-performing computer hardware when you're willing to spend more money.

Keep in mind the point of diminishing returns—a point where spending more money and getting higher-powered hardware isn't going to provide a noticeable difference in the performance of your system. For example, running a single-line BBS on a 66MHz 486 machine is a waste of a perfectly good computer. On the other side of the coin, running 64 lines at high speed on an old 4.77MHz XT just isn't going to happen. Again, the vendor of the BBS software you'll be running is your best source of information on what computer is needed for your situation.

Multinode BBS software (and even integrated BBSs when operated with some types of BBS add-on software) may need multiple computers. If you'll need multiple computers, analyze your needs on a computer-by-computer basis. Is it necessary to have high-end Pentium-based PCs for every one of the computers, or can a mixture of 286-, 386-, or 486-based PCs do just as well?

Price vs. Reliability

Many BBS sysops operate their boards on home-brew systems they built themselves, or cheap PCs made by a local computer shop. Often, these systems are every bit as reliable as expensive name brands. In other cases, buying such a system is asking for disaster.

Having your BBS running with as little downtime as possible is a goal you should have. Although the hobbyist sysop is under no obligation to provide service to callers, the entrepreneurial or business sysop may be legally (or at least morally) obligated to put forth a good-faith effort to ensure that the system is available when it's promised. You should bear this in mind when making equipment choices.

Whether you choose (and pay for) a major brand name or go with a potentially much less expensive no-name system is dependent primarily on your level of technical ability and willingness to deal with problems as they arise. It's also dependent on your financial wherewithal.

Select a brand-name system, such as Dell or Compaq, when one or more of the following apply to you:

- **Money is not a major concern** Major brand-name systems cost more, in exchange for some of the benefits you'll receive from going with one.
- **Warranty or on-site service** Major brands normally have a better warranty than their no-name counterparts, often with service available at your home or office. On-site service is particularly appealing to BBS sysops, since a service person will come to you, minimizing downtime in the event of a system problem. Some companies offer parts-exchange services for convenient swapping of defective parts.
- **Superior integration** When you buy a complete system from a major vendor, you can be reasonably certain that all the components will work together and have been tested and warranted to do so. With no-name systems, you often have to build it yourself, selecting the various components (such as video cards, LAN adapters, hard disk controllers, and so on) on your own. Conflicts of various types (memory, hardware addresses, and so on) are not uncommon in situations where

you integrate the components of the system yourself. A preconfigured brand-name system can help you avoid these types of problems.

- **Easier upgradability** Buying a major vendor's computer often provides you with easier upgrade paths, with the continued assurance of compatibility between components. Today's PCs often feature upgradable CPUs (the microprocessor) so you can add more computer power when you need it; buying from a major vendor that advertises such options may mean that this type of upgrade is more trouble-free. And if you do have trouble, you can be reasonably certain that the vendor will still be around to help you.

Select a no-name clone system under these circumstances:

- **You have technical expertise** If you are a computer tinkerer, then you may be willing and able to integrate your own system, picking the components that suit your needs best. If something does go wrong, you'll be able to address it yourself, and you won't need the help that a major vendor can provide you.
- **You need to save money** There's no doubt that going with an off brand or build-it-yourself system will save money. If you will be setting up a multinode BBS with many PCs, then you'll likely need to keep careful control of your money.
- **Reliability is not paramount** If you are comfortable with your BBS being off-line and unavailable to callers from time to time, then the lower reliability of some no-name systems may not be a problem for you. The money you save buying an off brand may in fact allow you to afford to keep spare parts or components on hand in case of a failure.

Where to Buy Computers

There's no question that computers are everywhere. From mail order to small shops to major computer chains to department stores, you'll be able to find computers for your BBS quickly, cheaply, and easily. The platform is the only factor that will affect this; PC-based BBSs are going to be the easiest to provide hardware for and will be the least expensive as well. Macintosh systems are available in fewer locations, and the prices are generally

much higher than for a PC of equivalent power, since there is no competition in the manufacture of Macs (Apple makes them all). Many UNIX-based systems can employ an IBM or compatible PC, in which case you'll be able to select inexpensive hardware. UNIX workstations, on the other hand, are available only from specialized resellers; their reduced market means prices are higher.

Computers are available from three primary sources: manufacturer direct, mail-order reseller, and retail. PCs are available through all three of these channels, while other computers (such as Macs) are generally available retail only.

Manufacturer direct is currently one of the more popular ways to buy a PC. This is really just a variation of mail order, where the machine is purchased by phone or mail from the company that makes the PC. Dell, Zeos, Gateway, and Northgate are four of the more popular PC companies that work this way, and all of them started their business by mail order (although some are now available retail as well). The advantages of this method are that you're dealing with the manufacturer directly. It's probably a safe assumption that you'll be receiving better service and better prices by cutting out the middle man, but that's not universally true.

Mail order is probably the second most popular way to buy a PC for your BBS, since it's one of the most cost-effective. Mail-order houses sell equipment made in whole or part by other companies. In this category I include many manufacturers, since most of the smaller companies may assemble the PCs, but they don't manufacture any of the components themselves. This category also includes companies that resell major name brands by mail. Whatever type of mail-order house you deal with, you're likely to save money going this route.

You also increase your risk to some degree, since some companies that sell by mail order are here today and gone tomorrow. As I mentioned before, check with the Better Business Bureau or the attorney general's office of the state the company is located in to see if there are excessive numbers of complaints or even pending legal actions against the company.

The retail category actually has many subcategories, since everything from a mom-and-pop corner computer store to a major retail chain falls into this group. Where you buy will affect price,

support, reliability, and return policies. I recommend buying from established businesses, no matter how large or small they may be. Again, check with the Better Business Bureau for negative reports on any business you plan to work with.

Service Plans

As I mentioned previously, many computers come with liberal warranties and on-site service. These usually last a maximum of one year, after which you'll pay for any computer repairs on your own. Many computer vendors and resellers have extended service plans you can purchase at additional cost to extend the basic warranty of your system.

Service plans may be a good idea for some, but most people should probably skip them. Consider a service plan only under the following circumstances:

- **Expensive computer** Where IBM compatibles can often be replaced more cost-effectively than they can be repaired, some Macintosh computers and most high-end workstation computers are quite costly, and repair is the only real option in case of failure.
- **Long-term use** With computer technology advancing at a rapid pace, most people consider a computer's lifetime to be only two or three years. If you expect to keep a computer for longer than that, a service plan may be a cost-effective way to ensure that the system will remain operational over the long term.

For virtually anyone else, a service plan is simply not cost-effective, given that most computers are quite reliable and unlikely to fail in any serious fashion before they become obsolete.

Bus Types for PCs

IBM-compatible PCs are offered with a variety of different types of bus—the facility where you insert expansion cards such as serial ports and internal modems. These are often called *slots* because you insert the expansion card into a mating slot on the bus. Since so many different bus types exist, it's often confusing to sort out which is best when you're buying a PC.

ISA

ISA, Industry Standard Architecture, was designed by IBM for the original IBM PC, and revised later for the IBM PC/AT. This type of bus is by far the most common type available in PCs. It offers both 8-bit and 16-bit slots for expansion (8-bit and 16-bit refer to the width of the data pathway between the expansion device and the computer's main circuitry). Most expansion cards available for PCs today are designed for the ISA bus.

EISA

EISA, Enhanced Industry Standard Architecture, was developed by a consortium of non-IBM computer companies as a 32-bit extension to the basic ISA technology. Its purpose was originally to compete with IBM's MicroChannel architecture (discussed below). EISA bus machines are fairly common today, but generally you pay a premium for the capability. In addition to supporting ISA expansion cards for backward compatibility, EISA also supports special 32-bit, high performance expansion cards.

In a BBS environment, the biggest benefit of EISA is the availability of fast disk controller cards that take advantage of EISA's 32-bit design. Many BBSs need extremely fast disk performance, and an EISA-based PC coupled with an EISA disk controller can provide this fast performance.

MicroChannel

MicroChannel was developed by IBM as a next generation bus to replace their ISA bus design. Many people claim that MicroChannel was an attempt by IBM to reclaim market share it had lost to competitors through the open architecture design of its original PC. By making MicroChannel proprietary and unavailable to competitors (except through licensing), IBM hoped to lock others out and regain its superiority.

If this was IBM's mission, they have failed in its execution. Although MicroChannel-based PCs are still sold by IBM, they represent a very small percentage of overall, industry-wide PC sales. Although MicroChannel does offer a 32-bit expansion bus, it is unattractive to most PC buyers because MicroChannel is not

compatible in any fashion with ISA expansion cards. Only MicroChannel expansion cards work in a MicroChannel bus.

VL Bus

VESA Local (VL) Bus was developed by the Video Enhancement Standards Association, a computer industry trade group. Originally envisioned as a way to offer high performance video displays, VL bus technology has been adapted for other types of expansion too, in particular high performance disk controllers. VL Bus expansion slots are an extension of ISA technology, they offer backward compatibility with ISA expansion cards.

VL Bus offers 32-bit technology, but unlike EISA, VL Bus expansion cards can communicate electrically with the computer's circuitry at the full speed of the computer. Other 32-bit bus technologies are not designed to operate at full speed. For this reason, VL Bus offers extremely high performance expansion capabilities when compared to the alternatives.

As with EISA, the main advantage of VL Bus to a BBS sysop is the performance of disk controllers. VL Bus disk controllers are capable of very fast data transfer rates, which can benefit busy BBSs.

Bus Summary

One of the most important things to remember about the expansion bus of a PC is that only certain types of cards can be used in a particular expansion bus. Table 5-1 identifies which cards can be used with which bus types.

Table 5-1
Compatibility Between Expansion Cards and Bus Types

↓ Card Type — Bus Type →	ISA[A]	EISA[B]	MicroChannel	VL Bus[B]
8-Bit ISA	✓	✓		✓
16-Bit ISA	✓	✓		✓
EISA		✓		
MicroChannel			✓	
VL Bus				✓

[A] Older, obsolete XT class PCs only support 8-bit ISA cards.

[B] A few PCs offer VL bus and EISA together in the same slot. In these cases, both EISA and VL Bus expansion cards can be used in the same machine.

Understanding Hard Disk Requirements

Most people naturally tend to talk about hard disks only in terms of their capacity. However, you need to think about many other things when selecting a hard disk for your BBS, including not only size, but interface method, controller type, and speed. This section will help you understand these elements so you can make informed choices.

Calculating Hard Disk Size Needs

The size of the hard disk system is the first decision you need to make. The size of the disk is directly related to the type of BBS you'll be running. If yours is a simple hobbyist BBS or if you run a BBS in conjunction with your service bureau business, for example, chances are you can get by with a minimal hard disk. On the other hand, if your goal is to offer a huge variety of shareware and freeware files for the general public to download, then you may need several gigabytes' worth of hard disk capacity.

Most computers come equipped with 100Mb to 300Mb of hard disk space, enough to run a worthy average BBS. Even if you expect you'll need more space, you may wish to get started with a smaller capacity and add more capacity once the system is operational.

Many potential sysops worry about how much disk space the BBS software will consume. In most cases, the BBS software and the various utilities that come with it consume only a megabyte or two—not enough to worry about when planning your capacity needs. Check with your BBS software vendor to be certain about its disk use.

For systems with a large amount of files for download, plan on an average file size of about 100kb to 200kb per file, depending on what type of files you're planning to keep online. Many files will be smaller; many will be considerably larger. You may wish to take the time to calculate the average size of a sample selection of files you'll be posting on the BBS. Computer image files tend to be quite large, and simple utilities, technical information, and the like tend to be rather small.

Understanding Hard Disk Interfaces

For Macintosh computers and UNIX workstations, the hard disk interface choices made by the vendor of your computer are about your only choices. IBM PCs and compatibles offer different hard disk interfaces, so if you're using a PC you may need to think about the subject.

Although you'll likely find PCs (or may already own one) that have older MFM, RLL, or ESDI disk systems, today's PCs usually come equipped with either IDE (integrated drive electronics) or SCSI (small computer systems interface) hard disk systems. Generally speaking, IDE hard disks are used for capacities of 300Mb or smaller, and SCSI hard disks are used for capacities of 300Mb or greater. There are exceptions, of course, but this is the most common split between one technology and the other.

IDE hard disks are fast, simple, and reliable. Most of the electronics required to run the drive are integrated onto the disk drive assembly, which is why these hard disks are called *integrated* drive electronics (IDE). Many IDE drives also have integrated disk caching within the drive's electronics, helping raise effective disk performance. One of the attractive things about IDE drives is that they do not need *low-level formatting*, a setup process to initialize the drive media and prepare it to accept the operating system. This is sometimes a complicated process to perform on your own.

SCSI hard disks are fast and reliable, but they are not always simple to set up. SCSI offers promises to the PC owner, including the potential to chain several SCSI devices onto a single SCSI controller card and to run different types of devices (not just hard disks) from one controller. In practice, however, SCSI drives can be tricky to configure and usually require you to load software drivers to get things working.

Disk Caching

Disk caching is a technique that can boost the performance of your hard disk by a considerable amount, and hence, will boost the performance of your BBS as well. Disk caching comes in two types: software and hardware. Software disk caching is provided

INSIDER TIP. . . The Pitfalls of SCSI

SCSI is a popular choice among DOS-based BBS sysops, since it allows you to attach more than two hard disks to your computer (IDE and other interface methods limit you to two physical drives). For very large disk capacities, chances are you won't have any choice but to use SCSI hard disks.

SCSI hard disks usually require software drivers to operate. These drivers, which take a variety of forms, are usually supplied by the manufacturer of the SCSI controller. Occasionally, however, they are supplied by third parties and purport to offer extra features or compatibility compared to the ones supplied by the manufacturer.

SCSI controllers have the ability in some cases to control CD-ROM drives in addition to hard disks. This is where things often get tricky, however. Make sure you check with the manufacturer of your SCSI controller to determine whether its product offers CD-ROM support, and if so, what specific brands of CD-ROM drives are supported, what software drivers are required, and so on.

Installation and operation of SCSI hard disks is usually simple for only one or two drives. When you attempt to attach three or more hard disks to a single SCSI controller, you should be prepared to address some issues. Here again, the manufacturer of the controller will likely be your best source of advice. Cabling issues can arise, along with the need to load additional or special software drivers to get things working.

SCSI controllers for the PC come in two varieties: *bus mastering* and *non bus mastering*. Bus mastering is a technique where the SCSI controller bypasses the facilities provided by the computer to access memory in order to boost performance. Be forewarned: Bus mastering can lead to conflicts with many types of BBS software. If your SCSI controller is bus mastering, you may need to load special software drivers to obtain compatibility with the underlying system, even if drivers are not needed to make the disk drives operate. These drivers, compliant with a standard known as *VDS* (Virtual DMA Services), are needed in any case where a memory manager is loaded, such as QEMM, 386Max, or EMM386. Since these memory managers are often needed for BBS software to operate, the use of a bus-mastering SCSI controller can cause problems unless VDS-compliant drivers are loaded.

SCSI controllers that are non bus-mastering will not introduce these types of problems. Such controllers don't introduce the risk of incompatibility, since they follow normal procedures for I/O operations. This issue, however, means that nonbus-mastering controllers offer somewhat less performance than their more complex bus-mastering counterparts.

by loading a software driver when you start your system; hardware disk caching is built into your hard disk controller. Both work the same way.

With disk caching, every time your BBS (or any other applications software) reads data from the hard disk, a copy of the data is

retained in memory. If the same data is needed again, it is obtained from memory without causing the hard disk to do any work at all. The net result is that many types of disk reads occur much faster.

Most disk caches use special techniques and algorithms to optimize how data is retrieved from the hard disk so that the cache is more likely to contain requested disk data when needed. Many disk caches also cache writes—data written to the disk—by holding data in memory and writing it to the disk only when there's a batch of data to process, further increasing performance. This is usually called *delayed write-caching*, although some disk caches have other write caching schemes as well.

Software disk caches use your computer's memory for the cache. Hardware disk caches use memory installed on the disk controller for the cache.

As I mentioned before, most BBS sysops should consider disk caching. However, you should keep in mind the following:

- **Use hardware caching if possible** Hardware caching offloads the entire caching responsibility to the disk controller. In this way, there is no opportunity for the caching to conflict with memory or applications, as software disk caches can. Although more expensive than a software cache, a hardware cache is definitely more desirable.
- **Don't use write caching with a software disk cache** If your software offers the ability to cache disk writes, disable this capability. Write caching is almost always ill-advised, but in a BBS environment it can be particularly hazardous and introduces the potential for damaged or lost data. The benefits it provides are outweighed by the risk it presents. (If you have a controller-based hardware cache, this is not generally a concern.)
- **Install software caches carefully** If you use a software disk cache, install the software carefully. In most cases, a software cache for the PC should use extended memory (also called XMS memory). Check with the vendor of your BBS software to determine whether there are any potential conflicts with a software-based disk cache.

- **Pick quality caching software** If you use a software cache, you'll find many different types of disk caches to choose from. In fact, MS-DOS comes with a disk cache (SMARTDRV). But for maximum efficiency, software compatibility, and performance, choose a robust, stand-alone disk cache such as Super PC-Kwik.

Caution: If you operate a local area network (LAN), special caching software is often supplied with the LAN operating system. If your LAN comes with cache software, you should always use it instead of any other caching software for maximum performance and compatibility.

Understanding CD-ROM Drives

CD-ROMs are a popular addition to a BBS. They are used primarily for the storage and presentation of file libraries, collections of files (usually shareware and freeware) for download. As such, CD-ROMs are primarily used by hobbyist and entrepreneurial BBSs. The advantages of CD-ROMs are clear:

- **Convenience** You won't find an easier, quicker way to put megabytes of files online for your callers. Dozens of vendors of file library CD-ROM discs have already done the work of collecting files for you. (Magazines such as *Boardwatch* are a good source of advertising and information about CD-ROM vendors.)
- **Economy** CD-ROM file libraries are inexpensive, compared to calling other BBSs (usually long distance) or commercial online services to get the latest shareware or freeware releases. Most discs are under $75 each.
- **Capacity** A CD-ROM disc can hold hundreds of files without taking up a single byte of precious hard disk space.

There are, of course, disadvantages to CD-ROMs as well:

- **Slowness** Even the fastest CD-ROM drives have access performance on par with a floppy disk drive—very slow. In many situations, attaching a CD-ROM drive to your BBS will slow down the entire system whenever it's being accessed.

- **Multiuser limitations** Most successful BBSs are multiline. When multiple users are online, the more users who are accessing the CD-ROM drive, the worse the impact on the system, and the slower it performs for all users accessing it.
- **Extra software** Some BBSs need add-on software to eliminate or reduce the performance impact of CD-ROM drives. This represents additional expense for you as sysop, and the add-on software may use a different and foreign interface compared to the download services provided by the BBS that your users are accustomed to. (Refer to Chapter 4 for information about these add-ons.)

For many BBS sysops, the benefits outweigh the disadvantages when it comes to CD-ROM drives. You should carefully research what is required to attach CD-ROM drives to your particular type of BBS software. Your BBS software vendor is probably the best source for this information, but be sure to speak with sysops who run the same BBS software to find out what their experiences are with CD-ROMs.

Selecting a CD-ROM Drive

Many types of CD-ROM drives are available. Which one you select depends on your needs. When shopping for a drive, consider the following:

- **Speed** The faster the drive, the better. Select a drive rated no slower than 350 milliseconds average access time. The fastest drives available today are about double the cost of low-end, inexpensive drives. Spend the extra money for the faster drive. Like the prices of most computer equipment, CD-ROM drive prices have been falling and continue to do so. Shop carefully for the best performance at the best price.
- **Type** CD-ROM drives are available in two types: internal and external. Internal drives install in a drive bay on your computer; external units sit beside your computer and are connected to it via a cable. Which type you pick depends largely on personal preference.
- **Interface** Many CD-ROM drives come with their own interface cards. If you have a SCSI controller installed for

your hard disk, you may wish to locate a CD-ROM drive that uses a SCSI interface that you can chain to the existing controller. Make sure you check with both the SCSI adapter manufacturer and the CD-ROM drive manufacturer to make sure the two units will work together without difficulty. Also find out what software drivers you may need to get them working.

- **Capacity** CD-ROM drives usually hold one disc at a time. Like audio CDs, however, CD-ROM drives are also available in multidisc or carousel models that hold several discs. Note: In most cases, you cannot use a multidisc CD-ROM player on a BBS without using special add-on software for the BBS.

Selecting Serial Hardware

Virtually all BBSs are put online for access by callers via a modem. Modems are interfaced with computers through a serial port, a device designed to attach serial devices such as mice, digitizing tablets, occasionally printers, and the modems your BBS users will be calling into. Even in cases where a modem is not used, such as when a BBS is attached to an X.25 network (discussed in Chapter 6), you'll often still need some sort of serial hardware. Many different types of serial hardware exist, and this section is designed to acquaint you with the most common ones.

Traditional Serial Ports

Traditional serial ports are those you are most likely to find standard on a computer. In DOS environments, these are usually referred to as COM1 and/or COM2 ports; on other platforms, such as the Macintosh, standard serial ports are referenced somewhat differently. These standard ports can be provided on the computer's motherboard (the main system board of the computer itself) or may be provided by add-in expansion cards. In any case, only one or two standard serial ports are usually available on a computer. If you'll be running more than one or two incoming lines on your BBS, standard serial ports will not be enough. (I'll talk about some of your options later in this chapter.)

How Serial Ports Work

Although you do not have to know how serial ports operate to run a BBS, it can aid in your understanding of hardware requirements. On IBM PCs and compatibles, standard serial ports are *interrupt-driven*, like the PC's architecture. When a character is received through the serial port (for example, a character received by a modem attached to the serial port), the serial port hardware generates a *hardware interrupt*. As the name suggests, the microprocessor that runs the computer is interrupted from whatever it's doing at the moment.

An *interrupt-service routine*, part of the communications software using the serial port (such as your BBS software), is then run. This small piece of computer software code processes the character, removing it from the serial port and placing it where it can be manipulated later on. Once this tiny program is finished handling the serial port, it returns control to whatever operation the computer was doing at the time. This entire process lasts just a tiny fraction of a second, and it works transparently.

The faster the modems in use, and the more lines you run on your BBS, the more interrupts per second that occur. For example, a 2,400bps modem running full speed operates at 240 characters per second. This means that 240 interrupts are occurring every second—interrupts that must be handled immediately. If you run 15 lines on your BBS at 2,400bps, then 3,600 interrupts per second are occurring (240 times 15 equals 3,600).

Since the PC architecture uses interrupts for a variety of functions, each interrupt is given a number. These numbers are expressed as IRQ3 for Interrupt ReQuest line 3, IRQ4 for interrupt 4, and so on. In fact, IRQ3 and IRQ4 are the two interrupts reserved for serial port hardware use on a PC. IRQ4 is used by the COM1 serial port, and IRQ3 is used by the COM2 serial port. Other interrupts have other purposes; IRQ6, for example, is reserved for the floppy disk controller, and IRQ2 is often used by parallel printer ports or video cards.

PC serial ports use not only an interrupt, but a *base I/O address*. A base I/O address is a place in the computer's memory identified by a hexadecimal number, such as 3F8 and 2F8, and it serves as a

place for the BBS software to get things to and from the serial port. In standard serial ports on the PC, 3F8 is used by COM1, and 2F8 is used by COM2. Other I/O addresses have other purposes; 200 is used by joystick controllers, for example. Many devices, such as sound cards, video cards, LAN adapters, and so on, use one or more base I/O addresses.

Expanding Serial Ports

As I said before, IBM PCs and compatibles usually come equipped with two serial ports, and each one operates with its own interrupt. But what happens when you need more than two serial ports? Most people believe you can simply add more serial ports to the machine. The answer is not that simple.

First, one I/O address *cannot* be used by more than one device at the same time. For example, if you configured a serial port to operate at address 3F8, and you installed another serial port at address 3F8, you would have a *base I/O address conflict*, and neither serial port would operate at all.

Similarly, with standard PC serial ports, each serial port *must* have a unique interrupt number associated with it. For example, if you configured a serial port to operate at IRQ3, and you put another serial port in the machine that operated at IRQ3, you would have an *interrupt conflict*, and neither serial port would work—*even if the serial ports used unique base I/O addresses!*

The bottom line is that *every* standard serial port installed in a machine must have a unique base I/O address and interrupt line associated with it.

Note: On a PC, internal modems are configured just like a serial port. Think of them as a serial port and modem all in one. Thus, they too need a unique base I/O address and interrupt-line assignment.

Plenty of base I/O addresses are available, and therefore, setting a unique one for every serial port isn't a problem. However, interrupt lines are in short supply on a PC, so it's difficult to install more than two standard serial ports in one machine. This is fine for a 2-line BBS, but what if you need more lines? That's

where multiport serial hardware becomes a necessity, except in the following cases:

- **Non-PC platforms** On non-PC platforms, the interface of a serial port is different, and it usually doesn't use the concept of base I/O addresses and interrupts at all. Consult with your computer vendor or BBS software supplier to determine how serial ports are added to your machine.
- **MicroChannel PCs** On PCs with IBM's MicroChannel architecture, multiple standard serial ports on a single machine are not a problem as they are with non-MicroChannel PCs. However, most PCs sold today, unless they are made by IBM, are *not* MicroChannel, so the explanations I gave previously still apply.

Nonintelligent Multiport Serial Hardware

The most cost-effective way to add multiple serial ports to a PC or compatible is to use multiport serial hardware designed specifically for the purpose. *Nonintelligent multiport serial hardware*, contrary to what the name might suggest, isn't necessarily inferior to intelligent multiport serial hardware (which I discuss later). Rather, it's the simplest type of multiport serial hardware available.

Nonintelligent multiport cards, as supplied for use with PCs, are interrupt-driven just like standard serial ports. Each port on the multiport card has its own base I/O address to avoid conflicts there. However, all the ports on a single card run on the same interrupt, because that card has a unique interrupt assigned to it. The communications software (such as your BBS) knows that when an interrupt comes in on the corresponding interrupt line, one of the ports on the card must have a character ready. This narrows the field a bit.

In their simplest interface method, the ports on the card are each *polled* to determine which port has a character pending, and hence, which one generated the interrupt. When operating in this polled mode, each of the ports on the card must be checked by the BBS software until one is found to have a character pending, at which time that character is processed normally.

Most nonintelligent multiport serial cards also have an enhanced mode that employs a *status port*. When an interrupt is generated by the card, the BBS software looks at the status port (which uses a base I/O address like the individual serial ports). The status port communicates which port has a character pending, and the BBS software can then remove the character from the affected port and process it normally.

Some nonintelligent multiport cards have facilities to allow multiple cards to operate on a single interrupt. DigiBoard cards, for example, use a *daisy-chain cable* to physically connect up to four multiport serial cards on a single interrupt line. Not all multiport cards have this ability, however, and they are limited to one card per interrupt. Still, any nonintelligent multiport serial card is a step beyond standard serial ports because it allows you to attach several modems to your PC.

Many BBSs support nonintelligent multiport serial cards. They are less expensive than the alternatives, in most cases. Their configuration is usually straightforward, and their simple interface is reliable. Because they are interrupt-driven, however, they do not perform well when used in some environments. For example, multinode BBS software that operates under general-purpose multitaskers (such as DESQview) can't operate with nonintelligent multiport cards because the overhead of interrupt handling is too demanding. Other BBS software can easily accommodate up to 64 high-speed lines using nonintelligent cards with no difficulty whatsoever.

Intelligent Multiport Serial Hardware

Intelligent multiport serial hardware is different from its nonintelligent counterpart in that it's not interrupt-driven at all. Rather, intelligent multiport cards use special interface methods for the additional efficiency needed for some types of operating environments.

Intelligent cards are so named because they have their own microprocessor and memory on the multiport card, along with the serial hardware. A driver is loaded onto the card itself, another driver is loaded on the computer, and the BBS software is loaded atop that. Instead of using interrupts, the driver on the

card talks to the driver on the computer, employing whatever methodology the software designer sees fit to use. The BBS software talks to the driver on the computer, forming a three-part chain of communication.

Because intelligent multiport cards are not interrupt-driven, they are substantially more efficient than intelligent cards. This extra efficiency is needed by some BBS software. For example, all multinode BBS software that operates on a single machine uses intelligent multiport serial cards. They need the additional efficiency because they're running under a general-purpose multitasker, and an interrupt-driven (nonintelligent) card would bog the system down too much. Other BBS software doesn't support intelligent multiport hardware because the additional efficiency isn't necessary.

Expansion Chassis

The third way to attach many modems to a single computer is the *expansion chassis*. An expansion chassis is simply a way to expand the number of slots you can plug things into on your machine. The expansion chassis has an interface card that plugs into your computer; serial hardware or modems are then installed in the chassis.

Expansion chassis for BBS use are designed to accommodate traditional serial ports or internal modems. Special electrical facilities within the expansion chassis allow the sharing of interrupts and base I/O addresses among the cards installed in the chassis.

One benefit of an expansion chassis is that it allows you to use internal modems with your multiline BBS. These modems are generally less expensive than their external stand-alone counterparts. On the other hand, an expansion chassis is generally more expensive than multiport serial cards for comparable line counts.

Not all BBS software supports expansion chassis. If you choose to go this route, ask your BBS software vendor for support information.

INSIDER TIP. . . High-Speed Operation

Interrupt-driven serial ports on PCs and compatibles, whether standard serial ports or nonintelligent multiport serial cards, are fine for interface speeds up to 9,600bps. However, today's high-speed modems are usually interfaced at 19,200bps, 38,400bps, and sometimes 57,600bps or more. With serial data rates this high, you have special considerations you must address for successful communications. Here's why.

The heart of a standard or nonintelligent serial port is the *UART*, the universal asynchronous receiver/transmitter. (*UART* is usually spoken as a word, pronounced "yoo-art".) The UART is a computer chip integrated into the serial port hardware. Data being sent into and out of the port is processed by the UART one character at a time. Standard UARTs (known by their chip numbers, 8250 or 16450) can store only one character at a time internally. When a character comes in, it's held in the UART until it's extracted by the communications software (the BBS in this case).

Some video adapters and disk controllers achieve extra efficiency by locking out interrupts for short durations while they do their job. However, this can be problematic when you're running communications software at high speed. It's possible that interrupts will be locked out for a long enough duration that a character comes into the serial port before it's been processed by the BBS software. The character that was there is overwritten by the new character, and consequently, one character is lost.

This character loss causes displays to become garbled, file transfers to fail—an undesirable effect for a BBS people depend on. How can this situation be resolved?

The answer is a *buffered UART*. These UARTs, known by their chip number, 16550, can store more than one character internally. If for some reason a character isn't processed by the BBS in time, it is not overwritten when a new character comes in, and hence, there is no data loss. These 16550 UARTs require specific support in your BBS software; since high-speed modems are so common today, virtually all communications software (including BBS software) has 16550 support.

When shopping for new serial hardware, and if your BBS uses interrupt-driven serial hardware, you should always specify 16550 UARTs. Unfortunately, most add-on serial port boards and computers with built-in serial ports still come equipped with older, nonbuffered UARTs.

If you have such hardware, you may be able to replace the UART chip with a 16550 buffered UART. In most cases, however, the UART chip is permanently mounted and cannot be easily replaced. Your only choice in this event is to replace the serial hardware completely with a new device that has 16550 UARTs preinstalled (or readily replaceable).

Keep in mind that this applies only to traditional serial ports or nonintelligent multiport cards. Intelligent multiport cards use a different interface entirely, and the buffered UART issue does not apply.

Where to Buy Serial Hardware

If you're starting out small (up to 4 lines) you can often get by with standard serial port hardware, the kind included with most of today's PCs. If you need additional ports, you can add simple and inexpensive serial port cards. Check with your BBS software vendor; not all BBS software supports more than 2 lines on regular serial hardware.

For larger systems, you'll probably be in the market for a multiport serial card or an expansion chassis.

The expansion chassis used for BBSs are manufactured by BBS software companies and are generally sold directly or by resellers that carry the BBS software that goes with them. Keep in mind you're likely buying proprietary equipment in a case like this, not something that can be serviced at the local computer repair shop should something go wrong. Ask about warranties and service policies before you buy so you'll be prepared in the event of a failure.

Multiport serial cards are generally not proprietary. They are either the product of a company other than the BBS software company, or they may be OEM (relabeled) products of another company. In either case, the vendor of the BBS software is probably not the only source of the cards. Multiport cards are a specialized item; thus, you won't find them at your local computer store, and you'll have to do some digging to find them. For this reason, it may be easiest to buy them from your BBS software vendor if it sells them.

Selecting Modems for Your BBS

Modems are to your BBS what a storefront is to a retail business—the first contact that someone has with you. When a user connects a modem to yours, the quality and reliability of that connection is paramount for any successful BBS. This section is designed to educate you on the various aspects of modems, modem technologies, and selecting a modem for your BBS.

The Importance of Reliability

As I said previously, your modem is the first contact someone will have with your BBS when they call. If the connection fails for any reason, the caller won't be able to use your system. You cannot be successful in the operation of your BBS if some or all of your callers can't get through to the system. Furthermore, once users are connected, they must be able to *stay* connected reliably. For these reasons, the quality and reliability of the modem equipment you use on your BBS is critically important in order for you to realize acceptance of and success with your system.

Modems are one of the only areas of computing technology where you truly do get what you pay for in most cases. More expensive modems usually perform best and last longer, and cheap modems usually do not. Of course, there are exceptions, but do not look for modems to be the place where you cut a corner to save some money. Cheap modems are false economy in virtually every case.

Remember that the modems you attach to your BBS are powered on and expected to perform for callers 24 hours a day, every day, month after month, year after year. Modems that are designed for general dial-out use, the type you're most apt to find at the local computer store or mail-order house, aren't expected to have a 100 percent duty cycle—they're used just a few hours a week, and they're never used in auto-answer mode (as modems on a BBS are). Although a particular modem may be a steady performer and an excellent value for calling out once in a while, it may perform miserably, fail rapidly, or simply be temperamental when used on a BBS. Modems designed for rigorous corporate or industrial use are good choices. Check with your BBS software vendor to see whether a particular modem is supported by your package before you buy.

Finally, speak with other established BBS sysops to see what modems they've had good luck with. Your BBS software vendor may also be able to make recommendations to you.

A Brief Modem Primer

Modems come in a variety of speeds, called *modem data rates*. Data rates are measured in bits per second, or *bps*. Sometimes

this is referred to as *baud*, but the term is technically incorrect; bps is the proper way to refer to modem speeds.

Common modem data rates (in bps) are 300, 1,200, 2,400, 9,600, 14,400, and 28,800.

Do not confuse *modem* data rates with *interface data rates*. *Modem data rates* refer to the speed at which one modem talks to another. *Interface data rates* refer to the speed at which your computer talks to the modem. With low-speed modems (those running at 300bps, 1,200bps, or 2,400bps), the modem and interface data rates are usually the same. At higher speeds, and in any modem that features data compression or error correction, the modem and interface data rates are usually different. (I'll discuss this in more detail in a moment.)

Common interface data rates (in bps) are 300, 1,200, 2,400, 9,600, 19,200, 38,400, 57,600, 115,200, and 230,400.

Why are the modem and interface rates different above 9,600 bps? Although modems can theoretically talk at any speed, computer serial port hardware is designed to operate at specific speeds. These speeds are determined by the design of the serial port. Common serial port designs, as well as the chips used to make them, have evolved to support specific rates that turned out to be different than the way modems evolved. As you'll see, however, it's not important for them to be the same.

Two modem technologies are common today: *data compression* and *error correction*.

Data compression refers to the ability within a modem to compress the data being sent through it. When data is compressed, it is sent more quickly, and therefore, the effective transmission speed of a particular modem grows higher than its rated speed.

Error correction refers to the ability within a modem to correct errors that occur during transmission. Noise or other anomalies can occur during a telephone connection. On data connections, these problems can cause data to arrive in a corrupted or damaged state. Error correction fixes these errors by automatically resending any data that was corrupted or damaged, transparently and automatically.

Both data compression and error correction are features you should look for in modems. An older, well-established standard for these features is MNP, the Microcom Networking Protocol. MNP is a group of independent protocols: MNP levels 1 through 4 offer error correction, and MNP level 5 offers data compression. (There are other levels, but they are not common among modems you're likely to encounter.)

A newer standard for these features is V.42 (for error correction) and V.42*bis* (for data compression). Most modems that have error-correction and data-compression features support both MNP (in various levels), as well as V.42 and V.42*bis*.

Data compression requires that the interface data rate be higher than the modem data rate. Why? Imagine a hose carrying water. Simple logic and physics tell us that a given volume of water can come out the end of the hose no faster than it's being put in; water cannot be made up along the way. If the hose is pressurized at one end, it will come out faster, up to the capacity limit of the hose. Likewise, data compression cannot make up data along the way. If data compression is to perform its magic, data must be poured in one end faster than the modem is capable of carrying it. The modem then compresses the data as much as it can and sends it down the line. But the difference between the modem's ability to send data (the modem data rate) and the computer's ability to keep the modem filled with data to compress (the interface data rate) is necessary for data compression to work. That's why it's okay for interface data rates to be quite a bit different from modem data rates—and, in fact, why it's important that they are.

Seeing Past a Common Deception

Many modem manufacturers have taken to labeling their products with the interface rates they support, not the modem speeds they support. Watch out for this deceptive ploy. When you see such claims as, "Up to 57,600bps throughput!" or "Send data at a whopping 115,200bps!" don't believe it. But why are the manufacturers lying?

The manufacturers aren't really lying; they're just not leveling with you. When you add data compression to a modem's base

data rate, the modem performs better. For example, when you add data compression to a 14,400bps modem, it will send data faster than 14,400bps. But how much faster? The answer depends on the data you're sending.

Under ideal circumstances, it is indeed possible for a modem with a 14,400bps data rate to send data with an effective throughput of 57,600bps as some modems makers claim. Under *ideal* circumstances—circumstances that could only be reproduced in a laboratory, most likely. In the real world where you operate your BBS, it's extremely unlikely you'll achieve effective throughputs anywhere close to 57,600bps on such a modem. In fact, in most cases, you'll get performance somewhere around 18,000bps to 19,000bps effective throughput on that 14,400bps modem with data compression. Although that's certainly better performance than without data compression, it's nowhere near the 57,600bps that the modem manufacturer promises you.

The bottom line is to ignore the modem maker's claims about throughput, because they will never apply to you. When you buy modems, focus on the *modem data rates*—the speed at which the modem talks to another modem *without* data compression. Any additional throughput provided by data-compression techniques will then be icing on the cake, instead of something you expect but will never obtain.

ISDN Adapters

Modems are used where you'll be connecting your BBS to regular telephone lines, which represents the vast majority of BBSs. In Europe and increasingly in the United States, BBSs are using a technology called *ISDN*—high-speed digital telephone connections. ISDN offers many advantages over conventional telephone lines, but the primary advantage to a BBS is its extremely high-speed data rates.

Regular telephone lines are *analog* lines, which is why a modem is necessary. A modem turns the digital data of a computer into audio signals and back again. The limitations of these audio signals is why modems are limited in speed. ISDN is *digital*, so the computer's data doesn't have to be converted to an audible signal and back; rather, the connection from computer to computer

is entirely digital. As a result, much higher speeds can be attained than are possible with modems and regular phone lines. ISDN service can offer speeds of 64kbps, and sometimes up to 128kbps

ISDN, however, is not widely available in all areas. In fact, in the United States, ISDN is still fairly rare. This fact makes ISDN impractical for most BBS applications. If you need ISDN connections to your BBS, you need *ISDN adapters* to get the job done. These adapters come in various types.

The most common type of adapter interfaces with your computer through a serial port, just like a modem. This makes an ISDN connection just another line to most BBSs.

You should check with your BBS software vendor to learn whether ISDN adapters are supported, and if so, which types are supported. In many cases, ISDN adapters behave like a modem—including command sets and result codes—so they can simply be connected like any modem, and the BBS software doesn't have to know any different.

Keep in mind that most BBSs cannot support the sustained high speeds an ISDN connection is capable of. The maximum throughput of the connection will be limited to the highest speed the BBS supports. Although most BBSs currently have maximum data rates of 38,400bps, 57,600bps, or 115,200bps, most cannot drive a serial line that hard for sustained periods. As a result, the BBS can lag behind the capacity of the ISDN connection when it's running full tilt.

What Modems to Buy

Remember, reliability is paramount with the modems you'll use for your BBS. The modems that are easiest to find in retail outlets are often among the worst to use for your BBS. I recommend strongly that you stick with recognized brand names that have developed a solid reputation in the industry, even if they're not always especially easy to find. These manufacturers include Hayes, USRobotics, Telebit, and Multitech, among others.

With few exceptions, steer clear of modems that come as part of a computer bundle or complete system, or those that carry the brand of a computer manufacturer. These modems are usually

cheap, rebranded (OEM) modems from low-end, low-cost manufacturers. They may be great modems for calling CompuServe or Prodigy a couple of times a week, but it's doubtful they will be suitable for long-term use on a BBS.

For the same reason, avoid a store's own brand of modems. These, too, are likely cheap modems that have been relabeled. Just because the store or computer manufacturer makes a great PC doesn't mean it knows the first thing about modems.

Today's modems almost all use chip sets at the heart of their design. Chip sets are nearly a complete modem on an integrated circuit or two. A modem maker needs only to add support circuitry and firmware to the chip set, throw the unit in a box, and call it a modem. Many modem makers even identify the manufacturer of the chip set in a thinly veiled attempt to ride on the reputation of that company. It often works, especially considering that the leading modem chip set makers are Rockwell and AT&T, two large and well-recognized technology companies.

However, there's more to making a modem than throwing chips in a box and sticking a label on the front. The *firmware*, software stored in a computer chip, is what distinguishes great modems from the others. If you were to take a dozen different modems, all using exactly the same chip set, with thorough testing you'd find that you had 12 modems that were all quite different in design, behavior, reliability, and configuration. Do not be deceived by marketing or packaging that extols the virtue of a modem using a particular chip set—it has little or nothing to do with the quality of the finished modem product.

Buy external modems if possible. You'll find that modem problems are much easier to debug (for both you and the manufacturers of the BBS software and the modem) when front-panel LEDs and displays are available. These displays and indicators are not available when you use an internal modem. In many of the more common modem problem situations, the lack of these indicators means the difference between solving the problem quickly and easily, or having to go through elaborate, time-consuming steps to isolate it. Use internal modems only if you have no choice (as will be the case if your BBS software uses an expansion chassis for its modems).

Don't worry too much about warranties on modems. Any major failure is likely to occur early in the modem's lifetime. By the time you experience any long-term failures, it's a safe bet that it'll be about time to buy a new modem anyway, as modem technology has been advancing at a blinding pace (and is likely to continue to do so). Warranties of five years, or even lifetime warranties, are becoming common now, but it's unlikely you'll find a need for anything longer than a year.

The only exception to this advice on warranties is firmware. All software has bugs, no matter how well-tested it is. Firmware (the software inside the modem) is no different. From time to time, especially in modems that are relatively new models, the modem manufacturer may make available firmware upgrades. These upgrades fix known bugs and may also implement new and enhanced features. Make sure you ask the modem manufacturer what its policy is regarding firmware upgrades. Are they included in the warranty coverage, or are they handled separately? If firmware upgrades cannot be obtained free or at low cost after the warranty expires, and the modem has a short-duration warranty, you may wish to skip that modem in favor of another. The object is to make sure you can get firmware upgrades when available, and that they are available free or for a reasonable cost, independent of any general warranties.

Finally, talk to other sysops who've been online for a while. What modems have they found to be the most reliable? It's worth taking the time to ask questions.

Rack Modem Systems

When a BBS has a very high line count, it can become difficult to physically manage the stacks of modems that will be needed. As a result, many BBS sysops look for a better solution. That solution is a *rack modem system*. These systems are manufactured by most of the major modem companies.

Rack modem systems involve a chassis—the rack—and special slide-in modem cards. Most rack modem systems can accommodate 16 to 32 modems. In most cases, the rack is powered by a single AC connection, instead of the dozens of small power bricks that a stack of conventional modems would use.

Because rack modem systems are specialized, limited-market items, they are expensive and out of the reach of most entrepreneurial sysops. If you are a business sysop, or if you are already a sysop and you want to replace existing modems, you should consider purchasing a rack modem system. Contact modem manufacturers directly for availability and pricing.

Where to Buy Modems

Most computer retail stores carry modem products. Unfortunately, most of the major chains carry only a small selection of quality, name-brand products—if they carry them at all. This is because most computer users in the market for a modem don't want to pay the often higher prices of a good-quality unit. The cheap modems commonly available at these stores are fine for casual, routine, dial-out use. They are most likely not fine at all for 24-hour-a-day use, year in and year out.

Thankfully, many good-quality modems from major manufacturers have come down in price to the point where they are priced competitively enough to be available in retail stores. Two of the more common examples are Hayes' Optima modem series, and USRobotics' Sportster modem series. The various models within each of these two modem lines are price-competitive, while not forfeiting the quality these companies are known for.

Mail order is another popular choice for modem purchases. You're more likely to be able to find a company that sells the modem you're looking for when buying mail order instead of retail.

INSIDER TIP. . . Sysop Discount Programs

Many modem manufacturers offer special discounts to BBS sysops on modem purchases made directly from the manufacturer. These programs allow you to save a considerable amount of money on your modem purchases, and you should research the programs available before purchasing modems. (Many are listed in the Appendix.)

Modem manufacturers have learned through experience that BBS sysops often recommend modems to their users. By making you as a BBS sysop happy, they hope that you'll suggest their modems to your callers, thereby increasing sales for the modem maker. This is why steep price discounts are made available to sysops.

The specifics of sysop discount programs vary by modem maker. You can expect the following restrictions:

- **Already online** You may have to be online for a certain period to qualify. To keep just anyone from buying modems at a discount, the modem maker may require you to establish and guarantee that your system has been online for a certain period, usually at least six months, before you can purchase modems at the discounted rate.
- **Stay online** You may have to guarantee that you'll remain online for a certain period. To get their marketing value from selling you modems at a discount, a manufacturer may force you to assure them that you'll remain online for a period of time, often at least six months.
- **No reselling** You may be prohibited from reselling the modems. If you take your BBS off-line, or if the modems become obsolete, you may be contractually prohibited from selling the modems to anyone else. Some manufacturers clearly mark modems purchased on a sysop program as "Not for Resale" to discourage you from trying to sell them.
- **Quantity limit** You may be limited on purchase quantity. Most sysop programs limit you to a certain number of modems, usually a maximum of the number of lines you have installed but often fewer.
- **Proof of lines** You may need to supply copies of your phone bill. This is to prove the number of lines you're running on your BBS.
- **Advertise** You may have to advertise the company's modems. Some sysop programs force you to mention the modem manufacturer's name on the opening screen or banner of your BBS for callers to see. If this is the case, the manufacturer will often verify that you have done so.

There may be other limitations as well. Despite all the rules, however, you can save a significant amount of money, often 50 percent or more over retail prices, by taking advantage of a sysop discount program. Once you've selected a modem for your BBS, call the manufacturer to find out whether it has a discount program available for BBS sysops. You should also stay tuned to BBS publications such as *Boardwatch*, which often publish information about these programs.

Buying BBS Software

Probably the single most important piece of your system is your BBS software. You can use several avenues to buy BBS software: direct, retail, and from resellers or consultants. I discuss these options in this section.

Buying Direct

The BBS software industry hasn't yet grown to the point where BBS software has entered the mainstream. As a result, the most common place to buy BBS software is directly from the software manufacturer.

The biggest negative in buying direct is that you'll likely pay full list price for the software. It's rare that BBS software makers will discount their own products. On the plus side, you're likely to find that the software is in stock and available for immediate delivery. Most BBS software manufacturers will be happy to send you their products overnight or by second-day air for a modest additional charge if you're in a hurry for it.

Buying Retail

The BBS industry is just reaching the point where some software brands are available retail. Until recently, the market for BBS software hasn't been large enough to justify making the software available through retail distribution channels.

Once you've selected the brand of BBS software you want, check with software stores in your area. Major chains such as Egghead Discount Software, Software, Etc., CompUSA, and so on are the most likely to have BBS software on their shelves. Don't expect them to necessarily have the particular brand you're looking for, but it's worth checking.

Most software stores, especially the major chains, will probably order any software for you if you prefer to purchase the software from a store. On special orders, you are unlikely to receive discount pricing, and you are unlikely to be able to return the software to the store if you're not happy with it. I recommend this route only if you're ordering the software for your company, and your company has net terms or other buying arrangements with a store you prefer to deal with. Make sure you're certain of your software choice, or check to see whether the software can be returned to the BBS software vendor directly if you're not happy with it.

As the BBS industry grows, you can expect to see more and more BBS software brands available retail. For now, the selection is small, and it's limited to PC-based software packages.

Buying from Resellers and Consultants

Many consultants and resellers specialize in BBS software. As the BBS industry has grown, so has the market for their services.

Some of these consultants and resellers discount BBS software, and you may well be able to save money by buying from a reseller instead of the BBS software vendor. *Boardwatch Magazine* and other industry publications are a good source of resellers; look for their ads. Proceed with caution, since not all resellers are as honest as the companies whose software they sell.

Be especially cautious of the software. Open the package carefully when you receive it. Check for any signs of the software being previously opened or installed. Are the disks contained in an envelope, and if so, has the envelope been opened? If one or more pieces of the package is shrink-wrapped, inspect the contents for any sign of previous use or abuse; the package may well have been rewrapped by the reseller. Make sure a product registration card is included. If it isn't, contact the BBS software manufacturer immediately, and determine whether one should be in the package. If there is *any* evidence of previous use, contact the reseller first and ask about it. If the reseller is uncooperative, contact the BBS software maker and find out what pieces should be in the package, and how the pieces are wrapped or put in the package. If you receive a package that has been previously opened or installed, you should return it immediately for a refund, and deal with another reseller. *Do not* accept previously installed, used software. You paid full price, and you deserve new merchandise.

Selecting and Buying a LAN

LANs, or local area networks, are a means to connect multiple computers to share resources such as printers and hard disks. LANs are required for multinode BBS systems (depending on line count) and can also be used with many integrated BBS packages for special applications and functions. Whether you need or want a LAN for your BBS is dependent on two factors: BBS type (integrated vs. multinode) and what you'll be doing with your system. This section is designed to familiarize you with the basics of LANs and to assist you in making wise buying decisions regarding LANs for your BBS.

Traditional LANs

LANs work on the concept of a *workstation* (sometimes called a *client*) and a *server*.

A server serves workstations that are connected to it and works as a central processing hub. A server is usually dedicated, meaning its sole function is to be the LAN's server, and it's not used for running application software. Servers are usually high-powered, large-capacity machines. In most LAN environments, the server's hard drive holds data for the entire network, as shown in Figure 5-1.

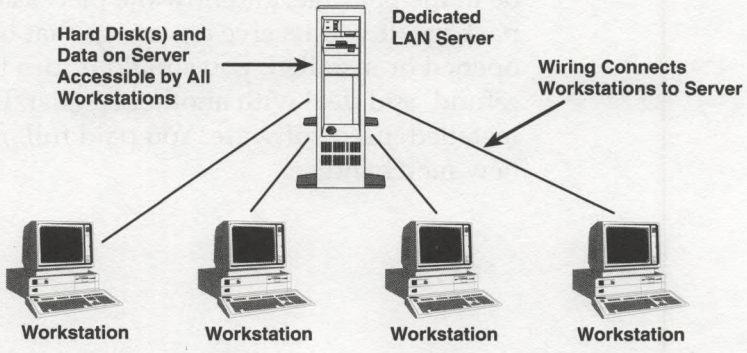

Figure 5-1
Traditional LAN concept of server and workstation (client)

Dedicated servers usually have special facilities for improving the performance of disk drives connected to them. These facilities sidestep the operating system's file-storage methods, loading file information into memory where it can be accessed more quickly. Even normally slow devices, such as a CD-ROM drive, operate much more quickly when connected to a dedicated server because of the special file I/O techniques employed.

Workstations on a LAN can access disk drives attached to the server. This disk drive sharing occurs transparently; application software (such as a BBS) treats these *redirected* drives as though they were on the workstation itself. LANs have security controls that can limit which data workstations can access. Workstations can use printer facilities located on a server as well, allowing multiple users to share access to an expensive laser printer, for example, instead of having a printer at each workstation.

In a BBS environment, LANs are most often used with multinode BBS software. Workstations run the BBS software and have incoming lines connected to them, and a dedicated server holds common information (such as user account data), download areas, and so on.

Peer-to-Peer LANs

In recent years, a slightly different type of LAN has become popular, called a *peer-to-peer* LAN. Rather than following the traditional workstation/server model, in a peer-to-peer setting all workstations can also be nondedicated servers, as shown in Figure 5-2. Peer-to-peer LANs are popular in home offices or small businesses because no dedicated server is required, and data on any computer on the LAN can be accessed by any other computer on the LAN. Peer-to-peer LANs also provide printer sharing and security controls, just like a traditional LAN.

A computer connected to a peer-to-peer LAN is always configured as a workstation, but may optionally be configured as a server as well. Servers can have their hard drives accessed by other LAN users, but hard drives on a workstation-only (nonserver) computer cannot.

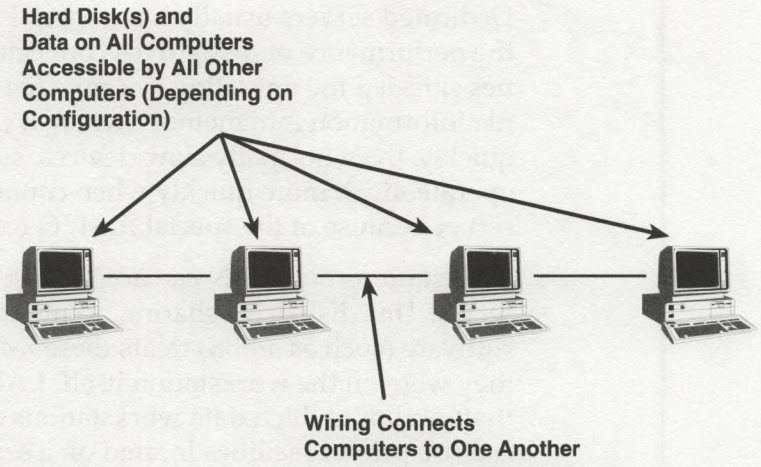

Figure 5-2
Peer-to-peer LAN, where all machines are peers (no dedicated servers)

Peer-to-peer LANs are used with multinode BBS software (as described previously for traditional LANs). Peer-to-peer LANs are also popular with integrated BBS software users for secondary processing (called *slave* or *nanny machines*), ease of file maintenance, gateway doors, and so on. Peer-to-peer LANs are generally much less expensive than traditional LANs, and they are usually much easier to install and configure.

LAN Hardware

All types of LANs require wiring that physically and electrically connects the PCs on the LAN. The wiring attaches to the computer through a *LAN adapter*. LAN adapters (also called simply *network adapters*) come in a variety of types.

The type of LAN adapter you select depends on, among other things, the LAN software you choose to run. You must make sure your LAN hardware is supported by the LAN software you select. Peer-to-peer LANs often come in the form of starter kits, which contain network adapters, cabling, and LAN software. In this case, you don't need to shop for LAN adapters separately. If you'll be using a traditional LAN, however, you should consult with the vendor of the LAN software for advice on what types of network adapter cards the software supports.

Ethernet adapters are currently the most popular type of network adapters for LANs. Ethernet provides good performance and easy and straightforward connections, and its popularity means that adapter cards are available at low cost. Ethernet wiring takes three forms:

- **Twisted-pair Ethernet (TPE)** TPE uses telephone-like RJ-45 connections and inexpensive cabling. It uses the IEEE 802.3 10Base-T Ethernet standard. Cables can run up to 100 meters. This type of Ethernet is used for high-performance environments.
- **Thin Ethernet (also called Cheapernet)** Thin Ethernet uses a BNC connector and coaxial cabling. It uses the 10Base-2 Ethernet specification. Cables can run up to 300 meters.
- **Thick Ethernet (AUI)** AUI uses a multipin DIX connector and multiconductor cabling. It uses the 10Base-5 Ethernet specification. Cables can run up to 50 meters.

TPE requires additional hardware (which I'll discuss later); Cheapernet and AUI do not require additional hardware except for large configurations.

You may also use *token-ring* LAN cards, which have a slightly different configuration from an Ethernet card; you may also find systems that use proprietary LAN adapters that go with a particular LAN software system. You should avoid proprietary adapters, however; expanding the LAN later could be problematic and expensive if you're tied to a particular vendor.

LAN installations that are large or designed for particularly high performance may require hardware in addition to LAN adapters.

Concentrators are equipment that concentrate or bring together the electrical connections of a LAN. TPE (twisted-pair) Ethernet requires concentrators; other Ethernet connections do not. *Bridges* connect small groups or mini-LANs with other groups for more efficient connections between computers on the LAN. *Repeaters* are used in some network configurations to expand the maximum length of network cabling.

Whether you need these (or other) types of hardware devices depends on your circumstances. You should seek assistance from a LAN products vendor or from a consultant well-versed in networks.

LAN Software

LAN hardware alone does not make a LAN; you also need LAN software. This is usually called a *network operating system*, or *NOS*. LAN software is sold by most major computer software and hardware outlets. You shouldn't have much trouble finding a source.

Depending on the type of LAN you need, you may be able to take advantage of special starter kits that contain some number (usually a pair) of LAN adapters, the software you need to run them, and even cabling. Most peer-to-peer networks are sold in these economical starter kits.

Big LANs with dedicated servers, such as full-blown Novell NetWare, usually involve a software purchase only. You select and supply the LAN adapters on your own. In this case (and even for smaller, peer-to-peer LANs), you need one copy of the LAN software for each computer you connect to the network. With few exceptions, you cannot install the same copy of the LAN software on each machine; the copies are serialized for use on multiple machines. Make sure you buy enough capacity for your situation.

If your BBS software requires the use of a LAN, you should seek advice from your BBS vendor on selecting LAN software. It's possible the BBS software is tied to a particular brand of LAN. If they don't have a special need for the LAN, I recommend you stick with one of the major LAN software providers for maximum compatibility now and in the future. Without a doubt, Novell NetWare is the industry standard for full LANs. Artisoft LANtastic and Novell NetWare Lite are the two most popular peer-to-peer LANs.

Summary

After reading this chapter, you should have an understanding of the following:

- Many issues are involved with selecting and buying your hardware.

- Computer performance and reliability are often impacted by price.
- You can buy computers mail order, manufacturer direct, and retail.
- You should select the size of hard disk appropriate to your needs, then choose the proper disk interface method if applicable.
- Disk caching can help improve the performance of your hard disk.
- A CD-ROM drive is often part of a BBS when you wish to provide large libraries of file downloads.
- Traditional serial ports, which can be used in some cases, are interrupt-driven and have a unique base I/O address and IRQ assignment. (PCs only.)
- You can expand serial ports using nonintelligent (interrupt-driven) multiport serial cards, or intelligent cards for greater performance in some situations.
- Some BBSs use an expansion chassis.
- High-speed operation requires the use of a 16550 buffered UART in any serial port used for such operation that is interrupt-driven. (PCs only.)
- Modem reliability is of primary importance, and it is not usually obtained from modems commonly available through retail distribution.
- ISDN adapters are used in place of a modem when you use ISDN high-speed digital telephone lines.
- Modems are available through common distribution channels, but modem manufacturer's sysop discount programs are the more cost-effective way to buy a modem.
- BBS software can be purchased directly from the manufacturer (as it usually is), retail, or from resellers and consultants.
- LANs are an important part of many BBSs. Traditional LANs use dedicated servers; peer-to-peer LANs do not and are less expensive. LAN hardware consists of LAN adapter cards, and possibly concentrators, bridges, and other hardware.
- LAN software, called a network operating system, is also selected based on BBS vendor recommendations and your particular needs.

Worksheet 5: Buying Your BBS Equipment

Complete the following regarding your computer purchase(s).

Computer vendor _____

Make and model of computer(s) _____

Computer vendor checked against:

- ❑ Reputation
- ❑ Better Business Bureau
- ❑ Attorney General's Office

Computer warranty term _____

Includes on-site service? ❑ Yes ❑ No ❑ Not Applicable

Will you be purchasing a service plan? ❑ Yes ❑ No

Complete the following about your disk drive selection.

Hard disk capacity: _____ megabytes

Hard disk interface method used:

- ❑ SCSI
- ❑ IDE
- ❑ Other _____
- ❑ Not Applicable

If SCSI, is the controller bus mastering? ❑ Yes ❑ No
(If yes, get and install VDS driver in most cases.)

Will you be using disk caching? ❑ Yes ❑ No

If yes, will you use:

- ❑ Hardware (controller-based) caching
- ❑ Software caching

Will you be using a CD-ROM drive? ❑ Yes ❑ No

Complete the following about your serial port hardware.

Will you be using standard serial ports? ❑ Yes ❑ No

Will you be using nonintelligent multiport serial cards? ❑ Yes ❑ No

Will you be using intelligent multiport serial cards? ❑ Yes ❑ No

Will you be using an expansion chassis? ❑ Yes ❑ No

If you will be using interrupt-driven serial ports (traditional serial ports, nonintelligent multiport) on a PC platform, do you have high-speed lines? ❑ Yes ❑ No

(If yes, you will need 16550 buffered UARTs on the affected serial ports.)

Complete the following about your modems.

What make(s) and model(s) of modems will you select? _____

What modem data rate(s) will these modems support? Remember, modem data rates do not include any accommodation for the benefits of data compression.

- ❑ 300
- ❑ 1,200
- ❑ 2,400
- ❑ 9,600
- ❑ 14,400
- ❑ 28,800
- ❑ Other _____

Do your modems support:

- ❑ Data compression
- ❑ Error correction

If so, do they offer:

- ❑ MNP data compression / error correction
- ❑ V.42 error correction
- ❑ V.42*bis* data compression

Will you be needing ISDN adapters for your system? ❑ Yes ❑ No

Complete the following about your BBS software purchase.

What brand of BBS software are you planning to buy? _____

Where will you buy this software?

- ❑ Direct
- ❑ Retail
- ❑ Reseller / Consultant

What is the name of the person or company you are buying the software from?_____

_____

Complete the following if you are buying a LAN.

What type of LAN are you buying?

- ❑ Traditional (full)
- ❑ Peer-to-peer

What type of LAN adapters are you planning to use? _____

Who makes those LAN adapters? _____

What additional LAN hardware do you need?

- ❑ Concentrators
- ❑ Bridges
- ❑ Other _____

What network operating system (NOS) will you use? _____

6 Connection Options for Your BBS

A BBS doesn't do anyone much good without a way to connect to it. Normally, people dial a BBS through ordinary telephone lines. What type of telephone lines are needed? How many are needed? How are they connected? And what are the other choices for interconnection?

Connections to a BBS fall into three general categories:

- **Ordinary telephone lines** This is by far the most common type of connection to a BBS. In essence, you attach your BBS to one or more telephone lines, just as you do your regular home or office telephone.
- **Local access from anywhere** An odd mix of telephone lines and other types of connections, this category is for the BBS that needs to conveniently reach an audience spread over a wide geographical area—whether an entire country or around the world.
- **Miscellaneous** This is a mixed bag of interconnection methods designed for special purposes, usually business or institutional applications.

This chapter is devoted to fostering your understanding of the various options open to you.

Telephone-Line Interconnection

Telephone lines are by far the most common, the simplest, and the most cost-effective of BBS interconnections. Wherever telephone service can be obtained and electrical power is available,

you can set up a BBS and put it online easily and conveniently. And wherever these things are attainable, a computer user with a modem can initiate a call to a BBS.

The vast majority of modems you're apt to encounter in shopping retail or by mail are designed for use with ordinary telephone lines, and they are as simple to connect to the public telephone network as the telephone in your home.

The advantages of telephone lines are numerous:

- **Cost-effectiveness** There is no more cost-effective way to offer wide-area connections to your BBS. Every other type of connection to your BBS designed for public use will end up costing you significantly more than an ordinary, everyday telephone line. The cost of the modem is reasonable, and the cost of the telephone line is reasonable too.
- **Accessibility** Anyone who has a computer or data terminal and a phone line, virtually anywhere in the world, can connect a modem to that line and dial your BBS. No other connection type can offer you this type of anywhere, anytime accessibility.
- **Simplicity** Any modem you're apt to purchase off the shelf or order by mail can be connected to your telephone line with a simple telephone cable, the same type used by your telephone. In the United States and Canada, this takes the form of a standard modular connection known as an RJ-11 jack. (Many other countries offer similar connections.) You simply plug one end of a modular cable into the jack, the other end into your modem, and that's it—you're on the air and available to the modem-using world. Every other type of BBS interconnection is more involved in one way or another.

One User, One Modem, One Telephone Line

Many new sysops fail to realize that for every simultaneous user you want online, there is in fact one modem and one telephone line. If you want an 8-user BBS, then you need 8 modems and 8 telephone lines, as shown in Figure 6-1. If you want a 256-line system, you need 256 modems and 256 telephone lines. It's a

little unnerving at first to ponder having more than 3 or 4 phone lines in one place, especially if you'll be operating a BBS in your home. But always remember you'll need a phone line and a modem for every line on your BBS when using regular telephone interconnection.

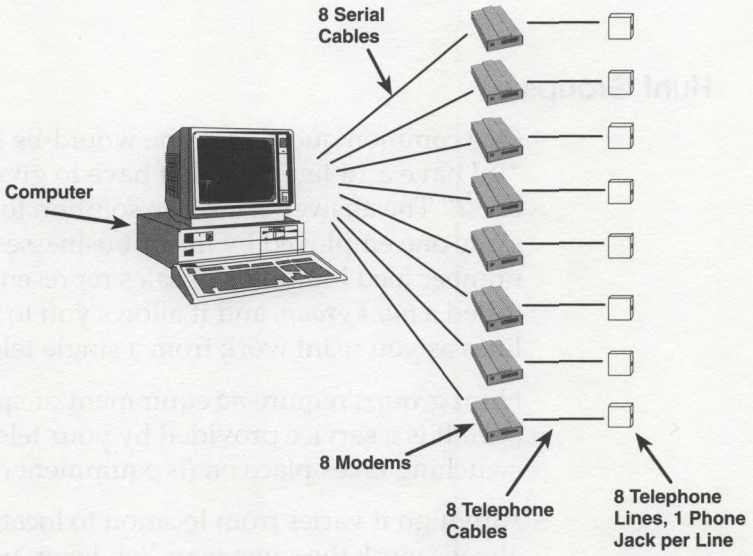

Figure 6-1
Equipment and wiring for a typical 8-line BBS

When you install a large quantity of telephone lines, it may be best to have your telephone company install the jacks for you, or to hire a telephone equipment vendor to do the job, instead of doing it yourself. Even if you do it yourself, be certain that you've installed enough capacity to handle your future growth. You may wish to install a *25-pair* or *50-pair* telephone cable from the point at which the lines enter your premises (in the case of a home-based system) or from the utility closet (in the case of an office building) to the site at which the BBS is installed. (A 25-pair cable supports up to 25 telephone lines; a 50-pair supports up to 50 lines.) That way, when you need to add more lines, you won't have to pay to run more capacity point to point. Instead, the capacity will be in place and the installation will consist of simply attaching more jacks and enabling the lines.

Having a professional install your lines makes sense in other ways, too: neatness. Having 8, 16, or 32 lines or more in one place can begin to look unwieldy unless the job is done professionally and carefully. Unless you feel confident in your ability to install the jacks yourself, it's worth it to pay a professional or your telephone company to have the job done right the first time.

Hunt Groups

One common question of the would-be sysop is something like, "If I have a 16-line BBS, do I have to give out 16 telephone numbers?" The answer is no. The solution to your problem is the same one employed by major businesses that have one telephone number feed hundreds of sales representatives, for example. It's called a *hunt group*, and it allows you to have as many telephone lines as you want work from a single telephone number.

Hunt groups require *no* equipment or special handling on your part. It is a service provided by your telephone company, and the switching takes place on *its* equipment off-site, not yours.

Although it varies from location to location, hunt groups almost always work the same way. You begin with a group of telephone lines, say 8 lines total. Each of the 8 lines has a unique telephone number, and each can in fact be dialed directly using the corresponding telephone number.

Through prior arrangement with the telephone company, you select one of the 8 telephone numbers to serve as the lead number in the group. That number rings to one of the 8 telephone lines. Then, again through prearrangement with the phone company, you pick a hunting order for the 8 lines. When your lead line is busy, the call is automatically connected to the second line in the group. If it's busy, it tries the third, and so on, until all of the 8 lines are full. Only at that point do callers get a busy signal.

This grouping of lines forms the hunt group, so named because the calls hunt from one line to another, to another, to another, and so on.

When you order telephone service for your BBS, simply ask for hunt group service as well. In many areas, hunt groups are marketed by the telephone company using a different name (such as *rotary group* or *forward on busy*). Simply describe to the telephone company's service representative the behavior you want, and they can set up a hunt group for you with your telephone service.

Important: Hunt groups are provided by the telephone company and *do not* require special equipment such as routers or multiplexers. You simply install several telephone lines and have them arranged in a hunt group by the telephone company—that's all there is to it. At your BBS site, the physical installation is the same as it would be if the lines were totally separate from one another.

INSIDER TIP. . . The Multiplexer Myth

Many potential sysops have asked me whether a *multiplexer* can be used with a single phone line to provide multiuser access to a BBS. Most people who ask this question probably don't understand the term. The answer is no, but some explanation is in order.

Multiplexers are hardware devices that allow several data connections to occur over a single dedicated data circuit. At first blush, this sounds like just the ticket for a BBS. However, multiplexers and dedicated data circuits are used in specialized data connection situations, such as banking, airline reservations systems, and so on, where the data flows from one fixed point to another fixed point. For example, a bank may use this methodology to connect a group of teller machines at one branch location to the main bank computer center located someplace else. The location of the branch never changes, and neither does the location of the computer center. The bank can pay the telephone company to install a dedicated data line from the branch to the computer center, connect a multiplexer at both ends, and run several simultaneous teller sessions over one physical line.

The important element here is that such a scenario is not dial-up—nobody ever places a telephone call. The data circuit is *always* connected from one point to another, and it never changes or moves.

Dial-up telephone connections—the type used on the typical BBS—take place through different interfaces at the telephone company and at your location. It is not possible through normal means to multiplex (share) one dial-up phone connection between multiple connections. Even if it were, remember that such scenarios involve connections from *one* physical location to *one* other physical location—a one-to-one relationship. BBSs need connections from *many* locations (users) to one location (your BBS)—a many-to-one relationship. That is why multiplexers have no application in the way that most BBSs are used.

Residential vs. Business Lines

In most areas, telephone lines are available in two basic rate groupings: residential and business. Residential lines are normally installed in the home for conventional home uses, such as calling friends, family, or associates, or calling your favorite local BBS via modem. Business lines are normally installed in an operating place of business, where the telephone is used for the solicitation of business.

Residential telephone lines are usually about half the cost of comparable business lines, making the installation and use of residential lines on a BBS desirable where it's feasible to do so. In a place of business, you will most likely be forced by the phone company to use business-rate lines. Only if you run your BBS in your home will you be able to consider residential-rate lines. Of course, business BBS sysops will always connect business lines to their systems. The hobbyist will virtually always use residential lines. Only the entrepreneurial sysop will need to make some decisions with regard to which type of lines to use.

Telephone companies obviously earn more money for the same level of service when they charge you business rates. It's like getting twice the money from you, the customer, for absolutely no extra effort or work on their part. For this reason, telephone companies prefer whenever possible to charge you business rates.

Entrepreneurial sysops who operate from a place of business will get charged business rates—period. Those that operate from their home, however, may be able to get away with residential lines, at least for a while.

Your telephone company will want to charge you business rates whenever you start to have a large number of lines coming into your home. Their logic (which is generally on target) suggests that there is no legitimate nonbusiness use for large numbers of telephone lines in a single residential location. You may well be able to get away with having residential rates if you have just a few lines connected to your BBS; 2, 3, sometimes as many as 8 lines will not be questioned. More than that, however, and your telephone company will likely call your bluff.

Of course, the entreprenerial sysop *is* running a business. It may be preferable to simply own up to that initially, and ask for business service from day one. That will also save you the shock if you switch later and your telephone bill doubles for the same level of service.

Battling the Telephone Company

The residential- versus business-rate argument doesn't end with the type of BBS you run, and it doesn't end with what you're willing to own up to. Telephone companies are increasingly getting into the business of harassing BBS operators, refusing to provide residential rates even to single-line hobbyist BBSs. You should be prepared for this type of reaction, and if you are a legitimate hobbyist (nonbusiness) customer, you should also be prepared to fight your telephone company before your state's public utilities commission if the need arises.

Telephone companies have in many cases decided that any type of BBS can't possibly fit into their definition of residential service due to the nature of its activities. In the United States, the reaction varies depending on the local telephone operating company serving your area. In particular, Southwestern Bell (which serves much of the central United States) has been extremely aggressive in charging all BBSs, regardless of functional purpose, business rates for their systems.

If you operate a legitimately nonbusiness BBS system, your best bet is to simply set up your BBS, order additional home telephone service, and refuse to be especially talkative or open with your telephone service representative about your purpose for ordering the service. I recommend avoiding the mention that it's even for use with a modem, since this will often raise suspicion and evoke questions from the telephone company. Should you be asked about the nature of your request, you can simply respond that you need the additional convenience or you need a line for your teenager, and end your explanation at that.

Should your telephone company find out about your BBS activities and attempt to charge you business rates, you'll simply have

to pay the bill when it comes if you are using your BBS to generate income or if it's in conjunction with a business. If you are truly hobbyist in your activities, and the BBS is not used for business purposes, do not hesitate to contest the rate increase with your telephone company.

If you cannot get satisfaction within the telephone company, file a complaint with your state public utilities commission. The commission will have instructions and guidance on how to accomplish this.

Finally, if the telephone company refers to tariffs (policies filed with the state utilities commission) regarding residential use or BBS use, ask the telephone company to provide references to specific tariff filings in your state. Then get copies of these filings from your public utilities commission. Often tariffs don't make concise references to what constitutes residential use and in virtually all cases they don't mention BBSs at all. Check the tariffs carefully and educate yourself. Never take the telephone company's word for what the tariffs say or don't say about BBS use.

Again, it's important for me to emphasize that if you are a business, you can expect to pay business rates. You may well be able to fool the telephone company for a short time, but I don't recommend doing this in the first place, let alone trying to maintain the charade as your BBS grows. Figure telephone-line expenses into your business plan and deal with the costs, whether they seem reasonable and fair or not.

Saving Money on Phone Costs

You can save money with your telephone service in many ways. The first is the type of dialing plan you have. Dialing plans vary widely by telephone company and regional area, but there are generally three types: unlimited, measured, and metered. These services may be identified by different names in your area, but the way they work is the same.

The first, unlimited, means that you can place an unlimited number of local calls at no additional charge within your local calling area, determined by the telephone company. For many

years, this was the only type of service the telephone companies offered for local service, and it's the type of service that most residential customers have. Certainly, an unlimited dialing plan is the most convenient for your home or business. In some areas, however, this type of service is no longer available.

The next two types, measured and metered, have charges involved for local calls. These charges can be based on the number of calls or the duration of your calls. In these dialing plans, you usually receive some small amount of service with your monthly charge before you're charged extra.

These dialing plans may make a difference if you're using the telephone for voice calls, but they make little if any difference to your BBS. Remember: Your BBS accepts incoming calls, and in most cases does not make outgoing calls. Dialing plans deal only with outgoing calls, so select whichever type of dialing plan offers the cheapest monthly rate (which will always be a metered or measured service, not an unlimited one).

Of course, there is one exception to this rule: if your BBS does dial out. If you run gateway software or e-mail networking (as described in Chapter 4), chances are you will be placing outbound calls. In this event, it's important to analyze your outward dialing patterns and frequency to determine which dailing plan might be best for you.

You can also save money on your telephone service by avoiding unnecessary extra-cost services. Many telephone companies now provide Touch-Tone service at no additional charge, but if you're in an area where Touch-Tone is extra, skip it. Even if your BBS does dial out, your software can usually be configured to command your modem to dial out using pulses instead of Touch-Tone, and you can save the additional monthly charge.

Custom calling services such as call waiting, three-way calling, call holding, call forwarding, and so on, are extraneous and totally unnecessary for BBS use. The only exception may be caller ID, which I discussed in Chapter 4.

Local Access from Anywhere

Regular telephone lines are not the only type of connection you can offer to your BBS. Especially in cases where you want to offer convenient access to your system from virtually anywhere, you may wish to consider other interconnection types.

Keep in mind what I mentioned at the beginning of the last section, however: The least expensive type of interconnection is the traditional telephone line. All of the types of connections I discuss in this section are costly—sometimes *very* costly. These types of connections should be considered only once your BBS is online and very well established, at which point the economies of scale are more likely to work in your favor. The only exception is the sysop of a business BBS, who may wish to consider these connection types to address the special needs of a business environment.

Keep in mind that the hobbyist sysop is highly unlikely to be able to afford any of the alternatives I'll be describing. Hobbyists will almost by definition have to stick with regular phone lines unless money is no object (unlikely for most of us).

The Burden of Payment

Before it's realistic to discuss specific technologies, one important concept you must understand is the *burden of payment*. This refers to who is responsible for paying the bill for connections to your system. On traditional telephone lines, the burden of payment rests with your BBS users (except for the small cost you pay for the telephone lines). If users are calling you long distance, then they are paying the bill for the call, and you do not need to be concerned about it.

Many of the interconnection alternatives shift the burden of payment to you. For the business BBS sysop, this may well be acceptable. For anyone else, you are instantly put in the position

of having to provide credit to your callers for the time they use. You then must bill your callers for that time—after you've already received your bill for the connect time and have had to pay it. You are also put in the position of having to bankroll your interconnection costs for the life of the system, since you'll always have a 30- to 90-day delay between the time you pay your bill for the interconnection costs and the time you receive this money back from your callers, beginning the first month you install it. With a 30- to 90-day lag time, you'll invest money initially—money you won't see again until you disconnect the service.

This cost is nontrivial. For X.25 systems (discussed later in this chapter), you may have several thousand dollars tied up at any given moment, bankrolling the interconnection costs against future repayment from users. This is money you will not have use of, and that will not be generating interest or other income for you while it's tied up.

INSIDER TIP. . . The Risks of Wide Access

I urge you to carefully analyze these alternatives before you seriously consider any of them. Some sysops I know have been financially ruined by proceeding with one or more of these alternatives without careful study.

Nearly all of these alternatives involve high up-front costs, and ongoing costs, and they require a large volume of usage to be even remotely profitable. Do not get yourself into a situation (especially a contractual obligation with someone) for any of these alternatives unless you are absolutely certain you can do so without major financial losses.

Do not take the word of a salesperson about the profitability of these alternative connection types—not from your BBS software vendor and certainly not from an interconnection service provider! These people are in it for the money, and they have *their* best interests in mind, not yours. Protect yourself, protect your finances, and protect your business by proceeding with *extreme caution!*

Finally, one more warning: Do not consider any of these alternatives unless your system is online, established, and profitable—unless you are lucky enough to have deep pockets and a hefty budget.

Understanding 800 Numbers

Virtually everyone likes the concept of being able to pick up the telephone, punch in a few numbers, and talk as long as necessary to someone on the other end of the line, without having to worry about paying the bill. In a nutshell, this is the psychology behind toll-free 800 numbers, and why they're attractive to BBS users.

Of course, in reality someone does pay the bill—you. In turn, you bill your customers for the time they've spent online. Psychologically, this still seems to work well for BBS users, since it seems as though they're calling for free even though they do get billed later for the connect time. Dialing a regular toll number involves a bit of an emotional barrier for many people, who equate it with expensive telephone bills. This is true, despite the fact that 800-number calls are more expensive than a normal direct-dial long-distance call.

In fact, 800 numbers generally cost between 10 and 30 cents a minute for calls originating and ending within the United States, depending on the type of service you select, the long-distance company, the time of day, and the distance of the call. On average, 800-number calls cost 30 percent to 50 percent more than a direct-dial call. Make sure you understand that if you subscribe to 800 service, you will be responsible for paying the entire bill. In addition to the per-minute connect charges, you'll also pay a monthly service fee to maintain your 800-number account. These monthly fees are quite reasonable—under $25, in most cases.

Bills for 800 numbers are usually itemized, with the telephone numbers of the calling parties along with their location (city and state), the time and date of each call, and its duration all listed on your bill. This provides a printed audit trail of all calls; it can be important in cases where a user on your system contests a bill for the time used.

In years past, 800 numbers were special lines that were brought into your premises much like a local telephone number. Today, with long-distance competition, 800 numbers are easier to contend with. Instead of using special lines or circuits, 800 numbers simply transfer to a local telephone number you designate. In the

case of a BBS, you'll likely give the long-distance vendor the lead number in your local telephone hunt group. Calls coming in via the 800 number will then be transferred directly to your system without any special installation, equipment, or changes at your premises.

Transferring to a local number, however, does have one disadvantage. When the phone rings, you'll never know whether the call is coming in from the 800 number, or whether it's a direct call to the local telephone number. You can circumvent this problem by installing separate local telephone lines, with their own numbers and hunt group, and have the 800-number calls transferred to that separate group. This is the desired method in situations where 800-number access to your BBS is mixed with other types of access. The downside, of course, is that you must have local phone lines, modems, and BBS software capacity for the additional lines coming through the 800 number.

Toll-free 800 numbers are best for these situations:

- You want convenient access over a wide area.
- You're willing to bill your callers for their connect time.
- You want the quality and performance of regular phone lines.
- You don't have high call volumes.
- You don't want to be forced to have special equipment to support the connections.

Understanding X.25 Networks

Have you ever called a large online service such as Prodigy or CompuServe? Most of us who own modems have used these and other services. The convenience is terrific; you simply dial a local telephone number to get connected to the service. No long-distance dialing, or 800 numbers, just a simple, ordinary local number. But is it so simple? No, it only looks that way.

These services use *X.25 packet-switched networks*, also called *public data networks*. Such networks provide national or international data pathways via an elaborate web of local access sites and high-speed point-to-point data connections. End users dial an access

site (usually a local telephone call) and indicate the host they wish to be connected to. (For people familiar with CompuServe, this is what you're doing when you type "CIS" after calling the local host.) Once the host has been selected, the data connection is routed through the network to its destination.

To connect your BBS to an X.25 network, you select and subscribe to one of the major data networks. One of the largest of the networks is BT North America (formerly Tymnet), a unit of British Telecom. It offers a wide range of international data services. All major long-distance vendors in the United States offer X.25 services as well, the largest of them being Sprint's Sprintnet, formerly (and more widely) known as Telenet. CompuServe, a unit of H&R Block, also owns its own X.25 data network and resells data services. Finally, ADP's Autonet markets aggressively to BBS operators.

Once you subscribe to an X.25 service, you have to connect your BBS to it. The network provides a high-speed, multichannel data connection at your site. To connect your BBS to the data feed, you need an *X.25 interface card* or an *X.25 PAD*, a *packet assembler/disassembler*. Not all BBS software or computer platforms offer support for X.25 interface cards. Those that do not need a PAD, which translates the multiple connections coming in through the data connection to multiple individual serial lines that can connect to virtually any BBS software or platform.

The primary disadvantage of X.25 networks is that they are extremely costly compared to the alternatives. Although their per-minute cost is lower than virtually any alternative, the monthly costs and the additional hardware needed to support them are costly indeed.

An X.25 interface card or PAD can cost several thousand dollars, an investment you will need to amortize over time. In addition, the monthly connection fee for these networks can run several hundred if not several thousand dollars *per month* depending on different criteria including data rates. This per-month charge is payable whether anyone uses your system through the network or not.

This is offset to some degree by the low connect fees, usually charged by the minute at hourly rates of $1.50 to $15.00 per hour,

depending on the network and billing plan you choose, as well as the time of day and the modem speeds in use. Many X.25 networks offer alternatives to hourly charges. The two most common are charging by the *packet*, and charging by the *kilocharacter*.

To understand charges by packet, you must understand how X.25 networks operate. The interconnections of an X.25 network form a high-capacity pipeline, able to handle a great number of data connections all at once. They accomplish the feat through *packet switching*. An oversimplification of the process would be, for example, a 9,600bps data connection point to point. Such a connection could handle the data of four 2,400bps lines (9,600 divided by 4 is 2,400). By sending small blocks or packets of each of the four connections quickly and switching rapidly between them all (each time sending a packet), the 9,600bps circuit can handle the four slower-speed connections quite easily. This packet-switching design, shown in Figure 6-2, gives the technology its name.

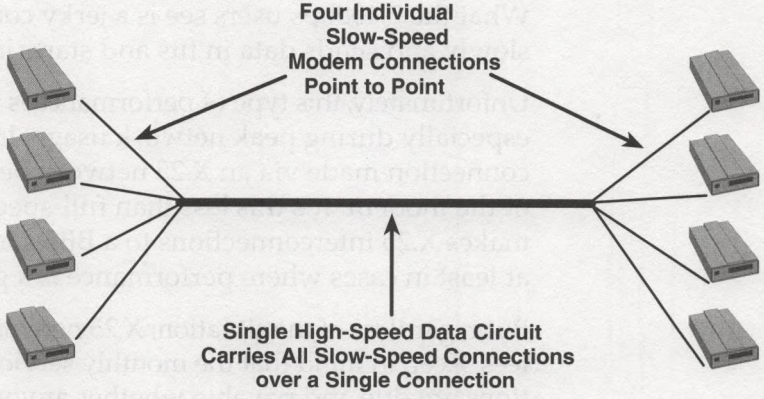

Figure 6-2
Packet-switching network operation

When a connection is active, packets aren't sent continually, only when data is ready to be sent. When you are charged by the packet, a small fee is applied to your account with the network each time a packet is sent.

Charging by kilocharacter is much simpler to understand. You are charged for each 1,000 (1 kilo) characters sent over the network, regardless of connect time or the number of packets sent.

The networks employ several techniques to optimize their systems. For example, a packet is sent only when there is data to go over the network, thereby avoiding the waste of capacity (bandwidth) on the high-speed circuit. Because people spend a lot of time online idle (not doing anything), the networks assume a certain percentage of that and intentionally overload the network. This is generally fine, except under full-load conditions.

For example, let's assume a network vendor intentionally overloads the network by 50 percent. That would mean (following the previous example) that a 9,600bps data circuit would be accommodating six 2,400bps connections instead of just four, a 50 percent increase. Most of the time this would be okay, since it's unlikely that all six users would be sending full speed all at the same time. But let's assume they do; that's 14,400bps' worth of demand (6 times 2,400 is 14,400) being stuffed into a 9,600bps pipeline. As you may have guessed, the net result is performance at only about 66 percent of full speed, or a little under 1,600bps throughput (instead of the 2,400bps the user is connected at). What the 2,400bps users see is a jerky connection that performs slowly and sends data in fits and starts instead of smoothly.

Unfortunately, this type of performance is typical of X.25 networks, especially during peak network usage. It is relatively rare that a connection made via an X.25 network performs at the full speed of the modem. It's this less than full-speed performance that makes X.25 interconnections to a BBS somewhat less than ideal, at least in cases where performance is a goal.

But regardless of the situation, X.25 networks have hefty monthly fees. Keep in mind that the monthly service charges for the connections are due and payable whether anyone uses the network to connect to your system or not. For this reason, connecting to an X.25 network involves a significant up-front cost, money you'll be throwing away for several months until call volume via the network gets high enough to amortize the fixed monthly costs over the actual usage.

My recommendation is to steer clear of X.25 interconnection to your BBS, unless you're enjoying tremendous success as an entrepreneur or are running a business BBS and your company is

willing to bankroll the effort. In any case, you should not seriously consider X.25 as a new sysop unless you have a significant amount of money to invest.

Comparing the Costs of Wide Access

The two most popular methods of providing access from anywhere are 800 numbers and X.25 data networks. Toll-free 800 numbers are less expensive for small usage volumes, and X.25 networks are less expensive for high volumes.

To analyze costs and compare them, you need to consider the fixed monthly cost of the service, amortize the additional equipment needed, and then take into account usage volume and per-hour costs. The 800 number has an advantage in that no additional equipment is needed. Table 6-1 shows these calculations for 100 hours of monthly usage, and Table 6-2 shows the calculations for 200 hours of monthly usage.

Table 6-1
Cost Comparison of 800 Number vs. X.25, 100 Hours Monthly Usage

	800 Number	X.25 Network
Fixed Monthly Cost	$15.00	$1,000.00
Amortized Equipment	$0.00	$100.00
Cost per Hour	$12.00	$6.00
Monthly Usage (Hours)	100	100
MONTHLY TOTAL	$1,215.00	$1,700.00

Table 6-2
Cost Comparison of 800 Number vs. X.25, 200 Hours Monthly Usage

	800 Number	X.25 Network
Fixed Monthly Cost	$15.00	$1,000.00
Amortized Equipment	$0.00	$100.00
Cost per Hour	$12.00	$6.00
Monthly Usage (Hours)	200	200
MONTHLY TOTAL	$2,415.00	$2,300.00

As you can see, with these particular values X.25 becomes cheaper somewhere between 100 and 200 hours of monthly usage. Of course, the numbers will vary based on many different criteria. The object is to make these types of comparisons before you commit to either interconnection method.

Other Wide-Access Choices

Toll-free 800 numbers and X.25 networks aren't the only methods to provide BBS access from virtually anywhere. Another method being marketed aggressively to BBS operators is the 900 or 976 number. We're all bombarded with television advertising for phone-sex services, psychics, and others who will bill an outrageous fee directly to your home phone so you can enjoy the services they offer.

After their introduction, 900/976 numbers enjoyed a brief surge in popularity. Their popularity has, however, waned in recent years due to their ugly (and largely well-deserved) reputation.

When you set up a 900/976 number with a long-distance telephone vendor, you work with the vendor to decide on a rate to charge for the service you're offering, either a flat per-call fee or a per-minute fee. Whenever someone dials the telephone number, his or her telephone bill is charged the amount you decide on.

The cost of a 900/976 number varies depending on the cost of the line (the cost to the people who call it), as well as the type of line, volume of calls, call capacity, long-distance vendor, and so on. The lines normally cost around $1,000 per month and run about $2,500 to install. The calls themselves cost 30 to 45 cents per minute, which you are billed for. The long-distance vendor charges 5 percent to 15 percent (sometimes more) of the amount billed to the caller for the billing and collection services the long-distance company will be providing you. AT&T estimates that 900/976 number services cost an average of $20,000 to set up when all costs (the lines, equipment, and so on) are considered.

Connections using 900/976 numbers can be done one of two ways: direct and indirect.

- **Direct** The 900/976 calls come directly to your BBS, just like any phone call. This has proven to be unsuccessful for BBSs that have tried it, since the meter is always running during the call, making callers uncomfortable and unlikely to spend much time online unless the services you offer are particularly outstanding.
- **Indirect** The 900/976 calls come in to a voice-response system, dialed by your BBS user with a normal telephone (not a modem). The response system provides a special code or number to the caller. The code or number can then be used online with the BBS to obtain credits for online time. The BBS itself is dialed separately through normal means. The 900/976 number is provided only for people to purchase credits for access time on the system and have those purchases charged conveniently to their telephone bill.

Although some BBSs have had some success using 900/976 numbers, most sysops who have tried it have been less than impressed with the acceptance and profitability, especially considering the investment in additional software and hardware to handle the 900/976-number credit-generating system (the voice-response system, as well as a BBS software module, are needed to provide the service and represent an additional cost).

Although you may wish to experiment with 900/976 numbers at some point, I would recommend that you wait until your system is established with normal access first. Even at that point, proceed with caution. Most sysops are disappointed with the results this method provides.

Miscellaneous Interconnection Options

Most BBSs have dial-up connections of the types I've already described in this chapter. But you may wish to take advantage of other options for BBS interconnection.

Keep in mind that the interconnection methods that follow are of interest primarily to business BBSs, and to a lesser degree entrepreneurial systems. Hobbyists will not generally be interested in any of these methods.

LAN Logins

Regardless of what type of BBS or computer platform you will be running, if you have a local area network (LAN), you'll likely want LAN users to be able to log into your BBS conveniently and easily. In fact, a BBS often makes an attractive e-mail system for your LAN, considering that the e-mail facilities are available to all users of the BBS, whether they are internal LAN users or outside dial-up modem users.

There are three types of LAN access to BBSs: integral, direct, and indirect.

Integral LAN access is essentially built into the structure of the BBS software. This is how most multinode BBS packages provide LAN access. Direct means that the BBS software supports one or more protocols for LAN login. Indirect means that a hardware solution is necessary to provide LAN access.

Integral LAN Access

Multinode BBS packages achieve multiline capability by running one copy of the BBS software for every line coming into the system, whether this is done with a multitasker (such as DESQview) and/or a LAN and multiple computers.

In order to be multinode and to operate in the manner that they do, these BBS packages have support already in place for multiple copies of the BBS software to communicate with each other over the LAN. It's then a simple matter to run another copy of the BBS software from a LAN workstation. This forms the basis for integral LAN access.

LAN users run a copy of the BBS software from their workstation. Once the BBS software is running, they use it to log in locally with the copy of the software they're running, thereby having access to all BBS functions from their workstation.

The BBS software can be installed on a server and made available to various LAN workstations. Due to network overhead, this can result in some performance trade-offs. To avoid this, the BBS software can be installed on the local hard disks of the workstations

that need BBS access, and they can simply run it from there. In either case, the result is the same.

Multinode BBS software packages are usually sold by their line count. Each LAN user who logs into the BBS counts as a line. If you own, for example, a 16-line multinode BBS package, then you're allowed a maximum of 16 simultaneous sessions, whether they are modem lines or LAN users.

Direct LAN Access

Direct LAN access is generally a feature of integrated BBS packages. LANs support various protocols, many specifically designed for asynchronous communications, which a BBS can use to support LAN logins.

IPX/SPX is a protocol used on Novell LANs. It's the protocol Novell uses to send all network I/O of all types, and it is a low-level protocol. Since it's not designed specifically for asynchronous communications, any BBS that supports IPX/SPX logins also requires special communications software for workstation machines. This is because in such cases, special proprietary methodology must be designed for the BBS and the terminal software so that one can understand the other intelligently.

INT14 is a standardized method for asynchronous communications on a LAN. Many communications programs support the INT14 method. As a result, a BBS that has INT14 support can be accessed from workstations using any terminal software that supports this methodology. Procomm Plus for Networks and Crosstalk for LANs are two such packages; they are special network editions of their regular COM-port-using siblings.

Finally, NASI/NACS may be used for LAN communications. When a BBS has such support, it emulates an *asynchronous server*. Like INT14, LAN versions of popular communications software support this protocol.

Indirect LAN Access

Indirect LAN access requires additional hardware between the BBS and the LAN in order to support logins. This additional

hardware is an asynchronous (asynch) server. Asynch servers are used in LAN environments to support modem pools—a method for LAN users to dial out via modem from their LAN workstations.

Instead of pooling modems for outdialing, however, an asynch server provided for LAN logins to a BBS typically uses direct-serial port to serial-port connections to the BBS itself in lieu of the modems. In essence, you're creating a connection pool to the BBS.

An asynch server usually consists of a computer, multiport serial hardware, and special software to drive the server. Of course, this computer is also connected to the LAN through a LAN adapter. Some asynch server facilities are self-contained hardware devices designed for use with specific LANs. Consult your LAN software vendor for suggestions on aysnch servers.

Hard-Wired Serial Lines

Sysops of all types may benefit from this type of BBS connection. Business BBSs can use hard-wired connections to let representatives, salespeople, support reps, and so on access the system from their desks. Other sysops may find a hard-wired line a convenient way to log onto the BBS from a nearby computer.

As the name suggests, this method involves hard-wiring—directly connecting—a data terminal or another computer to the BBS via a serial connection. In the case of computers, the machines are connected serial port to serial port through a *null modem adapter*, a small, inexpensive signal swapping device. Data terminals may or may not need a null modem adapter.

A null modem adapter is needed because an asynchronous serial connection is directional. For data to flow, the directional nature of the connection must be taken into account. It's much like the north and south poles on a pair of common magnets. When the two are matched properly, the magnets stick together. When they're not, the magnets repel one another.

A serial connection, instead of having north and south magnetic poles, has DTE and DCE. DTE, *data terminal equipment*, is a computer or data terminal. DCE, *data communications equipment*,

is normally a modem. When you connect DTE to DCE, you communicate successfully. When you connect DTE directly to DTE, or DCE to DCE, nothing happens (or at least no data is transferred!).

A null modem adapter electrically reverses a serial connection, allowing you to attach a DTE device (a computer or data terminal) to another DTE device (another computer or data terminal) and enjoy successful communication. Some data terminals can be configured to be either DTE or DCE. Remember your BBS is always going to be DTE (unless you have a null modem adapter in-line), so configure the data terminal as DCE if possible, otherwise use a null modem adapter.

Serial lines can be run a fair distance—several hundred feet under ideal conditions—but they cannot be an unlimited length without suffering signal loss (and hence lost data). Regardless of the length of a hard-wired serial connection to your BBS, I highly recommend you buy high-quality shielded data communications cable from a reliable source. *Do not* settle for cheap intercom or telephone wire or cable—it *is not* the same as high-grade data cabling, and it is unlikely to be shielded. The longer the cable run, the more likely you are to experience data loss, so using unshielded cable exponentially increases the chance you'll have trouble.

Shielding is important for two reasons. First, it keeps electromagnetic interference from entering the serial line along its run. This type of interference can result in lost connections and corrupted data. Second, it keeps the signal from leaving the cable along its run. This type of signal loss is called *leakage* and is much like a leaky water pipe. When there's a leak, the water pressure at the end of the pipe is reduced. Similarly, leakage in a serial cable results in reduced signal levels point to point. The lower the signal level, the more likely data loss will occur. The signal that has leaked can also cause interference to radio reception nearby.

Another important aspect of hard-wired connections is to use high-quality connectors and shielded connector shells (the casing around the connection itself). Use solid metal shells, not plated plastic; solid metal is more expensive, but worth it. In any case, never settle for nonmetallic (usually plain black plastic) shells.

Make sure that the shielding on the cable has good contact with the shell. The object is to make sure that the connection is shielded the entire length of the run, connector shells included, from one machine to the other. This dramatically increases how long the run between machines can be, and it greatly decreases the likelihood of data loss.

Finally, if you are uncomfortable making these connections or lack the tools (proper wire cutters, strippers, soldering iron, crimpers, and so on), hire a professional wiring company to do the job. All major cities have companies that specialize in data wiring; specify shielded cable and shielded connections when obtaining estimates.

Remember, the serial connections cannot be infinitely long. Very long connections (those hundreds or thousands of feet in length) may require the use of *short-haul modems*. These aren't at all like the modems you normally hook to your BBS. Short-haul modems are basically signal boosters for a serial cable. Many short-haul modems are line-powered, meaning that their circuitry runs off the power in the serial line. These devices can boost the length of a serial cable run by thousands of feet, and they are ideal in industrial applications where connections are spread out over a wide area.

Understanding Internet Services

The Internet is a hot topic in computer telecommunications. The Internet is an enormous worldwide network of computers, consisting mostly of educational and government computing sites. The Internet is not actually a network; rather, it's an umbrella metanetwork, encompassing hundreds of smaller networks. The Internet began in the late 1960s as DARPANET, a U. S. government communications mechanism used in defense research.

Since then, the Internet has grown considerably to encompass virtually all significant educational sites. In recent years, commercial entities have been connecting to the Internet to take advantage of its wide reach. Today, the Internet connects thousands

of organizations, mostly for electronic mail, but also for real-time networking. Virtually all significant electronic mail systems in the world have connections to the Internet. For this reason, once you have an electronic mailbox available to Internet users, you've reached nearly everyone in the electronically communicating world, as I discussed in Chapter 4.

The U. S. government has for several years been making moves toward an information superhighway, which has been covered widely in the mass media. Although the network will change in the coming years, in essence, the Internet is the information superhighway of today.

The Internet offers a variety of services in two forms: real-time and store-and-forward connections.

Real-time connections to and within the Internet are essentially a worldwide computer resource-sharing system, what is commonly called a *wide-area network* or *WAN*. The hundreds of computers that make up the Internet (mostly UNIX-based systems) are all connected in real time using a protocol called *TCP/IP*. Information is sent throughout the network in packets, or small units of data. Like paper-based mail, each packet has an origin and a destination. The packets travel from system to system throughout the network from their origin until they reach the intended destination.

Store-and-forward connections do not occur in real time. That is, a computer system is not connected to others at all times, but only when necessary. Store-and-forward connections to the Internet, which are used for electronic mail only, are discussed in Chapter 4.

Real-time connections are used for a variety of things, including real-time logins from one computer system to another. This type of connection is called *telnet* in Internet terminology.

Inbound Telnet Access

Telnet allows a user of a computer connected to the Internet to log in to remote computer sites in real time, using the network as a virtual serial connection point to point. The number of systems that offer telnet accessibility is growing rapidly, as are the number of

people who have outbound telnet capability. Figure 6-3 shows the connectivity pathway of a telnet session.

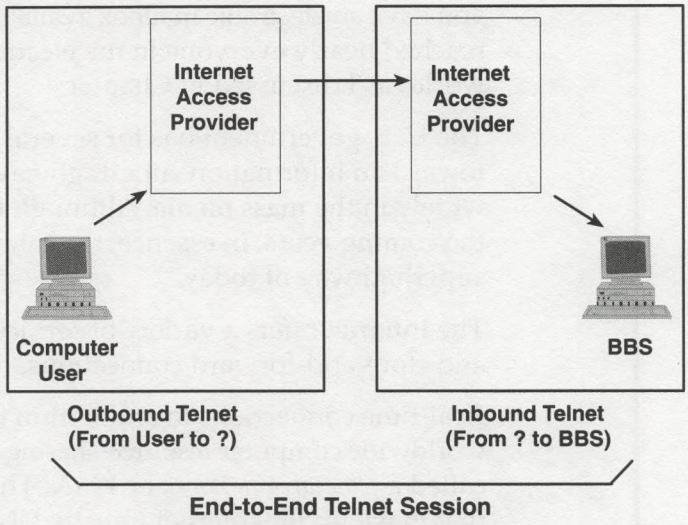

Figure 6-3
Internet telnet connections to a BBS

One advantage of telnet is that its reach is international in scope. A person who has telnet capability at a computer site can reach Internet computer sites anywhere in the world.

Operators of UNIX-based BBSs can often offer telnet inbound and outbound with little or no additional hardware or software. Most UNIX and UNIX-clone operating systems have TCP/IP support (the Internet networking protocol). For other platforms, you may or may not be able to add such support.

Government and institutions are the most likely BBS candidates for needing telnet access to their systems. Increasingly, however, some corporate and entrepreneurial BBSs want telnet accessibility as well.

Be prepared: Telnet accessibility is an expensive proposition. Specialized hardware is needed, and the monthly service fees can be significant. Although this may change in the future, for now, inbound telnet access requires considerable expense.

The first step is locating a site that can provide you with direct access. This service generally involves the use of a dedicated TCP/IP connection. Several commercial providers offer TCP/IP

service via 56kbps leased data lines or high speed T1 data lines. Expect to pay many hundreds of dollars each month for the privilege, on top of paying your telephone company to provide the dedicated point-to-point data line from your BBS site to the vendor you've contracted with for the TCP/IP service. Sometimes a dial-up version of TCP/IP can be used. Called SLIP, this service uses a conventional modem and telephone line to connect to your host. It is usually cheaper than a high-speed dedicated TCP/IP connection, but it's also quite a bit slower and doesn't support as many users.

The next step is connecting the live TCP/IP feed to your BBS. This is most often accomplished through the use of a *terminal server*. This device converts a TCP/IP connection into one or more serial connections that can then be attached to the BBS. When users access your site via telnet, the BBS responds and they can log on like any other BBS user. You may also need routers and other equipment to complete the connection.

An alternative is to set up a UNIX system and send it the TCP/IP feed directly. Users use telnet to access the UNIX machine, and they can then connect outward to your BBS in a two-step process, using special software and a serial-port to serial-port connection.

Yet another alternative is to connect your BBS to a LAN that offers TCP/IP support.

All of these methods of connecting your BBS to the Internet for telnet access are extremely involved, potentially very expensive, and are beyond the scope of this book. Seek advice from vendors of network services; a list of the larger vendors of such services can be found in the Appendix.

Outbound Telnet Access

Outbound telnet access means allowing users of your BBS to use telnet to access other computer systems on the Internet. As more and more people become familiar with the Internet, the demand for this type of service will grow.

One important item to bear in mind is that offering telnet connections inbound does not necessarily mean that your users can

use telnet outbound to access other systems. Again, UNIX-based BBSs will probably be able to offer this with little effort. On other platforms, you may have to go to some work to get the job done.

Some of the methods of providing inbound telnet access will allow support for outbound telnet as well. One simpler solution, a fairly common one, is to use a gateway or data-switch software option for your BBS. With such a package, you can connect users through a dial-up modem connection to an Internet host site, log in, and drop the user into a telnet session. I discussed gateway options in Chapter 4.

Inbound FTP

In addition to telnet login services, the Internet also provides a system-to-system file-copying mechanism called *ftp*, for *file transfer protocol*. Essentially, it allows the copying of a file from one computer system to another computer system, between systems that are connected to the Internet in real time.

Inbound ftp means that Internet users can copy files to and from directories on your computer. You must have a real-time, live connection to the Internet in order to provide ftp services. Here again, a UNIX-based BBS is likely to have this support directly, where other platforms will require special equipment to provide such a service.

If you have set up the sophisticated equipment to provide a real-time connection to the Internet for telnet purposes, you likely have the ability to provide inbound ftp service as well.

Outbound FTP

Outbound ftp is a service you provide for your users. When you have this capability, users on your BBS can connect outbound to other systems on the Internet and perform ftp file copies to and from those systems.

In a BBS environment, outbound ftp doesn't necessarily make much sense. When a file is copied via ftp, it is computer system to computer system. When a BBS is one of those systems, that

means that the file is copied to or from the hard disk on your BBS. Your BBS user still has to download the file, just as he or she would do for any other file on your BBS, before they can use it. Your BBS, in essence, becomes a temporary storage area for the file(s) they obtain via ftp. To work in reverse (sending the file via ftp), the user would have to upload the file to your system, then send it via ftp to its destination.

To avoid this two-step file copying process, your users are better off using telnet to connect to a remote site and directly uploading or downloading the desired file(s) using any standard file-transfer protocols (such as ZMODEM or Kermit) through the telnet connection.

Outbound ftp has the same requirements as inbound ftp—a real-time, live connection to the Internet, along with the equipment necessary to provide such a connection.

Summary

After reading this chapter, you should have an understanding of the following:

- All BBSs must have a way for users to connect to and use them. The sysop has several choices regarding connections to the system. Although conventional telephone lines are the most common, there are other choices as well.
- When regular telephone lines are used, you must have one line and one modem for each user you want to have use the system at one time. Multiplexers and other devices cannot be used to reduce the number of modems or telephone lines needed.
- Hunt groups are used so that you can give out just one telephone number to your users, yet provide large numbers of telephone lines on the system.
- Residential-rate telephone lines can be used by hobbyists, but more expensive business-rate lines are needed for entrepreneurs and businesspeople. Hobbyists may sometimes need to prove their eligibility for residential rates.

- Skipping extra telephone company provided services can save you money on telephone lines, as can selecting an inexpensive dialing plan.
- Many sysops want local access from anywhere. Almost all such methods shift the burden of payment from your callers to you. Toll-free 800 numbers and X.25 data networks are the two most common ways BBS sysops provide access for wide geographic areas. Also, 900/976 numbers are sometimes used on BBS systems.
- For business sysops, LAN logins can often be supported to allow LAN users to log into a BBS from their workstations. Direct serial-port to serial-port connections can be used in many situations for local logins too.
- The Internet, a worldwide network, is growing in popularity. It can be used to provide remote logins to Internet users, or outbound connections from your BBS to other Internet systems. Another feature, ftp, is used for copying files between Internet systems.

Worksheet 6: Connection Options for Your BBS

Complete the following with regard to telephone lines. Write the cost to the right of each option you are considering.

Will you be using regular telephone lines for logins to your BBS? ❑ Yes ❑ No

If so, how many telephone lines do you need for your system? _____ Lines

Which type of service will you use?

- ❑ Residential _____
- ❑ Business _____

Which dialing plan is least expensive for you?

- ❑ Unlimited _____
- ❑ Measured _____
- ❑ Metered _____
- ❑ Other _____

Do you plan to offer wide-area access to your system? ❑ Yes ❑ No

What type(s) of wide-area access are you planning to offer?

- ❑ 800 number _____
- ❑ X.25 network _____
- ❑ 900/976 numbers _____
- ❑ Other _____

Which of the following miscellaneous login types are you planning to offer?

- ❑ LAN _____
- ❑ Serial-port to serial-port (hard-wired) _____
- ❑ Internet connectivity _____
  - ❑ telnet _____
  - ❑ ftp _____
    - ❑ inbound _____
    - ❑ outbound _____
- ❑ Other _____

7

Installing Your BBS

After you have selected your software, hardware, and the connections to your BBS, it's time to get the ball rolling: Install and configure what will shortly become your running, living bulletin board system.

Installation begins with the physical placement of the BBS software onto your computer(s) and continues through the learning and configuration of the software itself. Configuration can be a lengthy process, as you set up message areas, file areas, surveys, bulletins, and other BBS functions.

Once everything is set up, you can begin testing things to make sure it's all put together properly. When that's complete, you can install any special BBS add-ons, put in any additional hardware, and hook up telephone lines and other connections to the system.

When you reach this point, it's time for opening day! This chapter will help you through all of the steps from where you are now to the first phone call from a real, live user.

Installing the BBS Software

The first step to the installation and configuration of your system is the physical installation of the BBS software. Installation procedures vary, of course, from BBS to BBS. Most bulletin board software has an installation program available to do most of the work for you.

Before you begin, make sure your system is prepared. Use the following as a checklist to make sure you're set and ready to go:

- The machine boots and loads the operating system normally.
- Various utilities or other software you may have installed load and run without difficulty.
- There is enough hard disk space available to install the BBS.
- If the machine was formerly used for another purpose, make sure you've cleared off anything extraneous that won't be used by or on the BBS (application software such as a word processor, and operating environments such as Windows are prime examples).
- You have adequate memory installed in the machine to meet the requirements of the BBS software.
- If the BBS software requires it, make sure you've installed and properly configured memory management software (such as EMS managers).
- If the machine was formerly used for another purpose (or even if it wasn't) make sure that resident drivers and software you won't need for the BBS are removed (such as DOS shells, sound card drivers, mouse drivers, RAM disk software, and so on). I recommend uninstalling everything that is a resident driver or program not needed to boot your system, even if you think you may use it later with the BBS. That minimizes conflicts with the BBS software or the installation process.

The main concern here is to make your system configuration as plain as possible before you install the BBS software.

Once you have cleaned up your system and everything appears to be working okay, begin the installation process according to the BBS software's instructions or documentation.

When the installation is complete, most BBS software can be run immediately with no additional steps in a demonstration or sample mode. Check to be sure you don't have to have serial port hardware and/or modems installed and configured before you attempt to run the BBS. You may need to perform additional steps before you can run the BBS software; check your software documentation to be sure.

In any case, test to make sure the installation was successful, whether that involves running the BBS or following some other procedure recommended by the manufacturer.

Learning the BBS Software

After the BBS software is installed and you're confident it's operational, it's time to begin learning the BBS software and how it works.

Many BBS packages are fairly involved. In fact, most of the ones that offer any reasonable level of functionality are going to be a bit intimidating at first. The most important thing to avoid is getting overwhelmed by the task in front of you.

It's important also to follow the directions recommended by the manufacturer of your BBS software for learning the product. Many packages come with tutorials, videotapes, training programs, and so on that can help. If the manufacturer recommends a particular process to learn the software, follow it. Keep in mind it will take a fair amount of time to learn your software.

In most cases, learning the BBS software should be tackled in the following order:

- **Load and shut down** Find out how to start (load) the BBS, and learn how to shut it down when you want to return to the operating system. Most BBSs have a particular key or key sequence that is used to shut everything down and go off-line. You'll need to know how to do this, since you'll be doing it often at first.
- **Log on** Determine how to log onto your BBS as the sysop. Virtually all BBS software comes with a default sysop user account you can use to log onto the system. Consult your package's manual or installation instructions to find out how to log on.
- **Passwords** If your BBS software uses passwords for user accounts, make sure you learn how to change your sysop password as soon as possible. Whatever you do, *do not* open

the system to the public without first changing the password to one only you know. This will protect you against people who may know the default password that comes with your BBS software trying to log on as you.

- **Access controls** Learn how access to your system is controlled. Most BBSs offer various forms of access levels or groups that allow you to prohibit access to certain system functions to particular users or groups of users. Needless to say, things such as sysop functions need to be limited only to sysop class users on your system, and be unavailable to others. Find out how your BBS software handles access control. When you learn how this is done, match the available access controls against your needs, and make a plan for how you will administer the various groups or classes of users on your system. Contact your BBS software vendor for help if you need it.
- **System features** Learn how to use various system features as a caller would use them. For example, make sure you know how to enter, read, and reply to messages on the system. Know how to upload and download files. Familiarize yourself with how these functions look and operate with your BBS software, if you're not already familiar with them from using other BBSs.
- **Small changes** Find out how to make small changes to the system, such as adding a minor feature or taking an existing one away. You'll be doing this often during the configuration of your system. With some BBS packages, this is one of the most important (and sometimes most difficult) aspects of getting the BBS off the ground. Some BBSs aren't very configurable and are therefore simpler to work with. Others offer many different options, and it will take more time to learn what's available and how it's used.
- **Big changes** Learn how to make big changes, such as adding or removing an entire section from the system. If your BBS uses a configurable menuing system, determine how to add or remove those menus. If your BBS software is SIG- (special interest group) or conference-oriented, find out how SIGs (or conferences) are added or removed.

Configuring the BBS

Once the software is installed and put together, and you've spent some time getting familiar with your software, now it's time to move on to the actual content of the system. You need to figure out exactly what to put online, assemble the pieces and resources you need, and get the job done.

Most of this process involves further planning and design on your part, followed by specific implementation. In the remainder of this section, I'll outline the areas you need to be concerned with. Since BBS software varies considerably from package to package, you need to learn on your own how to implement these things with the BBS software you've selected.

Message Areas

Message features are among the most popular elements of a BBS. Virtually all BBSs have message areas; the only exception might be a download service for a software company set up for the express purpose of allowing customers to download drivers, updates, and so on.

Local Message Areas

Local message areas are not networked or shared with other systems. (I discussed mail networking in Chapter 4.) If you are not networking with other systems, then all of your message areas are local. Figure 7-1 shows the various paths of communication possible with local message areas.

As I discussed in Chapter 1, message features come in two forms: e-mail and public. How these features are named varies depending on the particular BBS software you select.

You'll probably want to provide an e-mail message area on your system. This area can be used for communication between you and your users, or just between users.

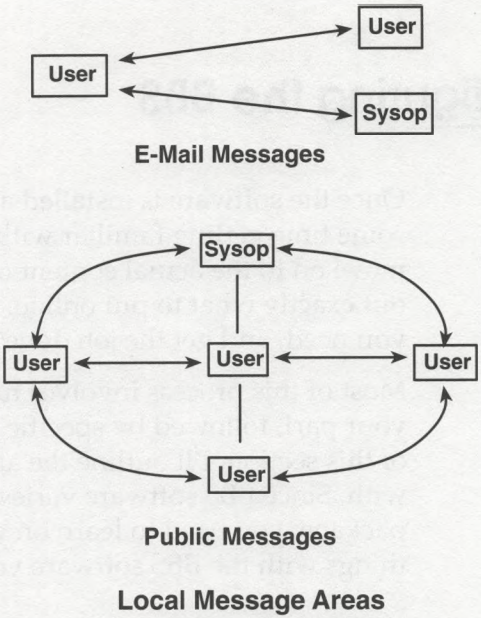

Figure 7-1
Communications paths available using local message areas

I recommend considering a Message to Sysop message area for your system. This is a message area where users can leave you mail when they encounter problems with the system or have questions about features or functions available online. In most cases, the comments left by your users are not available to other users. This confidentiality allows people who post messages to speak freely, without fear of being embarrassed about their questions or comments.

Make sure that you reply to these user comments and questions privately as well.

E-mail message areas can also be used to allow your users to communicate with other users confidentially. Keep in mind that most BBS software allows you to read your users' e-mail messages. Make sure you notify users—through bulletins, welcome screens, or new user materials—that you can read their private communication. Most seasoned BBS users already know this, but new BBS users are coming online every day, and it doesn't hurt to let them know that their private messages online are private only from other users, not from you.

Public message areas may be applicable to your situation as well. You'll likely want to have one or more public message areas that pertain to your BBS's theme. For example, if you run a BBS on carpentry, you might want public message areas on tools, wood species, joinery techniques, and so on. Message areas are one place you need to stay consistent with your theme. A message area on plastics forming methods is probably out of place on a BBS whose theme is cooking and home economics.

There are exceptions to this rule, of course. Many BBSs that market to the general public find that a wide variety of message areas on a range of topics is what users want. It's not unusual to find BBSs of this type with dozens (sometimes hundreds) of message areas on everything from shortwave radio to aquarium fish. Hobbies, especially various shades of computer technology, are perennial favorites.

Networked Message Areas

Networked message areas are those that you share with other systems. They too come in two forms: e-mail and public. Figure 7-2 shows the various paths of communication possible with networked message areas.

Networked e-mail is the basic reason why virtually all mail networks exist. Networked e-mail allows you and your users to communicate privately with other people on other computer systems. Public networked message areas, however, are one of the biggest draws to mail networking because they are one way to obtain a large number of busy message areas instantly. Virtually the moment you connect your BBS to a mail network, your system will appear busy and vibrant to your callers, since messages will be coming into your system from many other systems across the country or around the world.

Make sure you choose your networked message areas carefully. Keep in mind also that many networked message areas have a high *signal-to-noise ratio*. This term, borrowed from audio technology, refers to a situation where there are a large number of off-topic (irrelevant) messages in the message area.

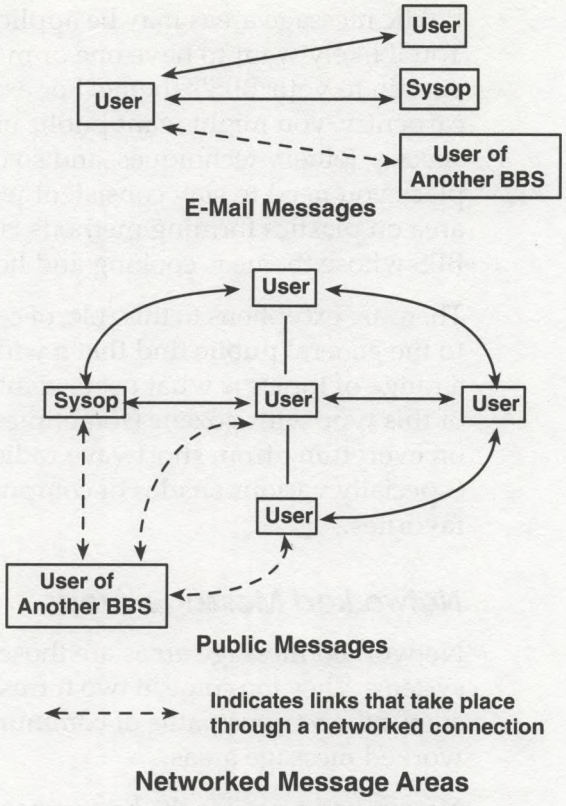

Figure 7-2
Communications paths available using networked message areas

File Areas

Nearly all BBSs have at least a small collection of files online for callers. Depending on your particular situation, you'll probably have file areas as well.

Organizing Files

No matter what type of files you put online, organization is an important part of your efforts. Every BBS can divide file areas into sections or categories; use this capability to your advantage. Nothing frustrates users more than finding dozens or hundreds of files all lumped into a single file area. Take the time to make logical, sensible category assignments for your files, move files to

the proper section, and keep on top of the effort as part of your system maintenance.

Finally, a master file list is a helpful item to have available to your users. The file list is basically a complete listing of all files on your system in all file areas. Some BBS software comes with utilities to generate a master file list; other software depends on third-party utilities to generate it. However it's done with your software, create this list regularly or schedule a system event to create it automatically on a regular basis. Make the finished list available for online viewing and/or downloading.

Files on Business BBSs

Many business BBSs are designed specifically for the dissemination of files. For such systems, one of the keys to success is to arrange the files in a manner that makes intuitive sense to the caller. Being able to search files is important, too; systems such as the Microsoft Download Service and WordPerfect's BBS are used by hundreds of people every day to obtain the latest printer drivers for their systems. The ability to search for a printer name or model is of particular importance on these and similar systems.

In a business environment, it is critical to ensure that the files are kept up to date. I recently spent half an hour downloading a large printer driver from a manufacturer's BBS, only to find out later that the revision it was shipping on diskette was ten revisions newer. If the BBS doesn't carry the latest editions of important files, what good is it? Communication between the people supplying the files and the people running the BBS is critical. The BBS should be updated regularly.

Also make sure that the files users want are made available. Put as many of these files on the BBS as reasonably possible. The object of a business BBS that offers files is to be a current, convenient, 24-hour-accessible repository of these files. If it is anything less than that, the BBS will alienate users (who will no longer trust it to be current). Such a BBS is of questionable value. Ensure that your BBS will succeed: Keep it well-stocked, and keep it current.

Files on Entrepreneurial and Hobbyist BBSs

Entrepreneurial and hobbyist systems will likely have huge libraries of shareware and freeware software files. System utilities and application software are the perennial favorites here, and thousands of such choices are available. (I'll discuss where to get these files later.)

In these cases, there is an odd dichotomy to the file freshness issue. Although most users will be calling your system for the latest shareware programs, some people will be looking to you to provide older files, too. For example, I recently needed to find video drivers for an old video card. I'd lost the disks that came with it, and the manufacturer had gone out of business. I called my favorite local BBS, did a file search, and sure enough—there were the drivers I was looking for, dated 1988.

Many sysops would naturally tend to delete files that old, assuming nobody could possibly want them. In this case, I was grateful that this sysop had left well enough alone and allowed his system to become a nice combination of the newest goodies and old trusty files somebody like me might need someday. I recommend you follow the same practice.

About Adult Files

Although sometimes considered to be the ugly stepchild of the BBS community, adult BBS systems thrive. Among the more popular features of such systems is the availability of digitized R-rated and X-rated images. These images, often scanned from copyrighted publications, circulate rather openly among adult BBSs. It is beyond the scope of this book to place value judgments on such activities; my only recommendation to the operator of an adult BBS is to exercise caution with regard to the content of such images. Child pornography is illegal in the United States, and it may cause the FBI and other regulatory agencies to bring actions against you. Hard-core images are also suspect. Allowing access to the images to minors is a huge risk. Copyright owners are getting aggressive about protecting their rights; *Playboy* magazine successfully sued a large BBS in the United States in 1992 for offering images scanned from its pages. Finally, most judgments

about what constitutes pornography hinge on community standards—what would be considered by the average person in your area to be obscene. Take this, as well as federal and local laws (which vary widely from area to area), into consideration.

Sources of Files

Building a file library is one of the challenges that face all sysops of a hobbyist or entrepreneurial system. Having a large and complete library online is one of the features that many of your callers will be looking for. Many of those callers look for quantity, others for quality. Either way, you'll spend a considerable amount of effort building your file collection.

Shareware and freeware software, graphic images, information, and other types of files that make up a good file library are available from a number of sources. Figure 7-3 shows some of the sources you can use to build your file library.

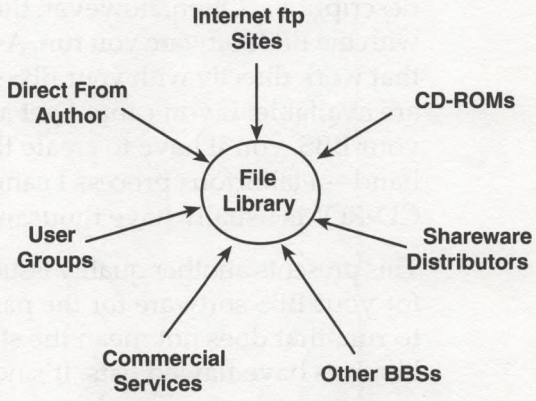

Figure 7-3
Sources of files for building a file library

CD-ROM Libraries

One of the most common sources of shareware and freeware files today is the CD-ROM. With these shiny metallic discs, the same size and shape as the audio CDs you play at home, you can hold thousands of computer files in your hand.

Producers of these discs have done all the work for you of collecting files and organizing them. You simply attach a CD-ROM drive to your BBS, throw the disc in, and with a little configuration you're off and running. Or at least that's how it's supposed to work.

You need to be aware of several potential problems with CD-ROMs. The first and most important is the quality of the collection. Frankly, many CD-ROM file collections are sloppily assembled. I've seen several discs that have duplicate files (the same file in more than one file area), files not organized properly (a spreadsheet application in the word processors section), and files that are bad (won't unarchive or have errors). This is yet another area where you're best off networking with fellow BBS sysops; ask others what discs and disc vendors they've used, and find out which of them have been problematic. A poorly organized disc will invite complaints from users.

Another consideration is the file list. File library CD-ROMs come with some form of file listing, which contains file names and descriptions. Often, however, these lists are not formatted for use with the BBS software you run. Ask the vendor if lists are available that work directly with your BBS software, or if conversion utilities are available. If you cannot get a file listing in the format used by your BBS, you'll have to create the file lists or convert them by hand—a laborious process I cannot recommend (remember, CD-ROMs usually have thousands of files per disc).

This presents another quality issue. Assuming file lists are available for your BBS software for the particular CD-ROM disc you want to run, that does not mean the story is over. Many CD-ROM libraries have flawed lists. It's not uncommon for the file list to contain entries for files that are not actually on the CD-ROM, or for the CD-ROM to have files on it that are not listed. Further, you may find listed files without descriptions. All of these things are signs that the disc was carelessly prepared. I recommend returning the disc to the seller in this case (if possible) and buying a disc (from a different vendor) that doesn't have these problems, since fixing them manually is time-consuming.

Still, CD-ROMs are a convenient, inexpensive way for you to add thousands of files to your BBS overnight. CD-ROM based file

areas should augment, not replace, hard disk based file areas. CD-ROM file collections start getting out of date beginning the day after they're released, with new versions of programs on the disc becoming available and so forth. Plan on replacing the CD-ROM every six months to a year to keep it from getting stale.

Finally, remember that CD-ROMs do not perform well in BBS use in many situations. Refer to Chapter 5 for further discussion on CD-ROM drives and issues with BBS use.

Shareware Distributors

Shareware distributors are another source of files. Shareware distributors are engaged in the business of collecting shareware and freeware software, then distributing the software on diskette (or CD-ROM) to end users. PC-SIG is probably the oldest and largest of these companies, but many are in business. Another popular shareware distributor is the Public Software Library.

These companies can, for a small disk-copying fee, send shareware releases to you on diskette. (These companies make their money from these fees—they don't license or register the software to you.) You can then post these files on your BBS for downloading. Many of these companies, in particular Public Software Library, analyze the various selections available, developing full reviews and ratings about quality. You can benefit from this effort, since they've already weeded out the lackluster choices for you.

Shareware is shareware, and authors of this type of software encourage copying as a distribution method for their software. It's not illegal for you to make copies of software legitimately released as shareware or freeware. However, shareware distribution companies generally frown on you buying their goods for posting on your BBS. You need to decide on your own whether you wish to go this route.

Finally, one disadvantage of using one of these distributors is that the disks of software will cost you money, usually a few dollars per disk. To buy an extensive collection of files, you'll end up spending a fair amount of money.

Other BBSs

Another source of shareware and freeware files is other BBSs. As quickly as new shareware releases circulate among BBSs, you can often find files not available in your area by calling large BBSs in other areas of the country. You can download these files and post them on your own BBS.

This practice is somewhat questionable, however. If you've been following along, you've probably gathered that developing a good file collection is a lot of work and potentially costly. In downloading files from other BBSs and posting them on yours, you may find sysops who consider such activities stealing their files. Again, it's perfectly legal to copy shareware and freeware programs, but some sysops are simply protective of their collections. Having invested time and effort in building their collection, they don't like some other sysop taking their work for nothing. You're most likely to encounter this type of response when you download the files from a local BBS—one that's likely to be competing with you on some level. Proceed carefully if you use this method of getting files.

Contrary to what this might suggest, some BBS sysops cooperate in the sharing of files. I've seen many situations where a sysop in one area will trade new files with a sysop in another area, each benefiting from the efforts of the other.

Other Sources of Files

Other sources of shareware and freeware files include the following:

- **Commercial online services** CompuServe, America Online, and many other commercial online services have extensive file areas. If you can afford the steep connect time, you can use these services as a source of files for your BBS.
- **User groups** Many computer user groups maintain extensive collections of shareware and freeware files. You may be able to obtain copies for free, or for a small fee if you're a member of such a user group.
- **Directly from authors** A laborious and time-consuming method of getting files is directly from the authors. Virtually

all shareware authors are willing to mail you copies of their software on disk, usually for a small charge. Some of these authors have programs specifically for BBS sysops, whereby you can receive the latest releases of their software automatically.

- **Internet ftp sites** If you have an account on a computer system connected to the Internet, you may be able to find files via ftp. Using ftp, you can copy files from remote computer sites to your local computer site. Contact the administrator of your computer system for information on using ftp, and for ftp sites (in the form of IP addresses) to get you started. Some trade magazines, such as *Boardwatch*, publish information about interesting ftp sites from time to time.

Questionnaires and Surveys

Questionnaires and surveys have wide applications with any type of BBS.

Business BBSs can use them for user polls, getting input from users on how pleased they are (or are not) with the services the BBS provides. This is valuable input for you to refine your service to match the expectations of your customers.

Business BBS operators can also put surveys out that poll users about product-related issues. Although these online surveys reach only those people who call the BBS, they can still generate valuable statistical information for your product development or marketing department. Since users answer these surveys electronically, the information can be tabulated and easily analyzed. Some BBS software packages even have built-in questionnaire facilities that can output the data in formats that can then be imported by database or spreadsheet applications for easy analysis.

Entrepreneurial and hobbyist systems will find numerous applications for questionnaires, too. New-user surveys are the most common—gathering information from your callers that you can use to verify them later on. It's fairly customary to request the name, address, and telephone number of your callers (and for entrepreneurial systems, you'll need this information to charge your users to be online). Questionnaires are the way this is

accomplished in most cases. Figure 7-4 shows how a new-user survey might look to a caller.

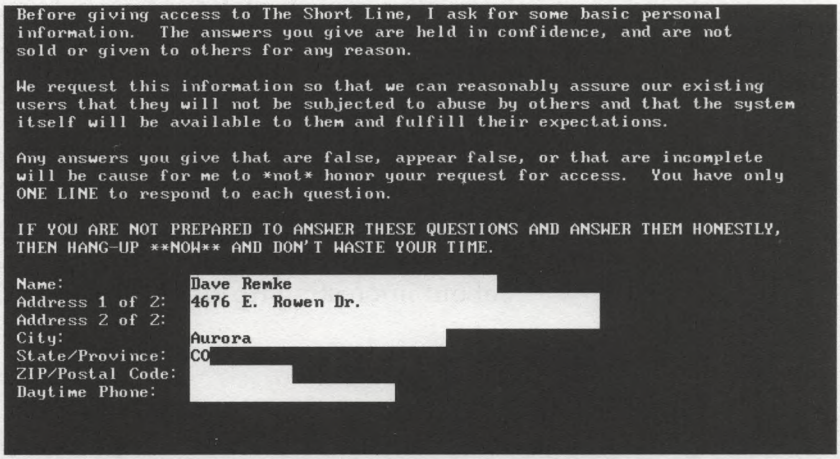
Before giving access to The Short Line, I ask for some basic personal information. The answers you give are held in confidence, and are not sold or given to others for any reason.
We request this information so that we can reasonably assure our existing users that they will not be subjected to abuse by others and that the system itself will be available to them and fulfill their expectations.
Any answers you give that are false, appear false, or that are incomplete will be cause for me to *not* honor your request for access. You have only ONE LINE to respond to each question.
IF YOU ARE NOT PREPARED TO ANSWER THESE QUESTIONS AND ANSWER THEM HONESTLY, THEN HANG-UP **NOW** AND DON'T WASTE YOUR TIME.
Name: Dave Remke
Address 1 of 2: 4676 E. Rowen Dr.
Address 2 of 2:
City: Aurora
State/Province: CO
ZIP/Postal Code:
Daytime Phone:

Figure 7-4
A new-user survey as it appears to a caller

Social systems often use questionnaire facilities for matchmaking. In fact, many BBS packages have questionnaire functions designed specifically for this purpose. Another common application is general entertainment; it's a fun addition to such systems to poll users about current news issues, politics, and so on, and make the results of surveys available online for other callers.

News and Information

Many BBSs are put online specifically to provide news and information of some description. A school district might put a BBS online to inform staff and faculty about meetings, upcoming events, resources, and so on available to them. This information could then be accessed by modem from individual schools in the district. Institutions and organizations often use a BBS to disseminate information; some is suitable for online display, and other material is probably best suited to downloading. Many BBS packages allow both reading and downloading to be integrated into a single user function online.

Generating Your Own Information

Often a business BBS posts technical help notes, user instruction files, corrections to manuals, and the like on a BBS; users can download and print this information on their own computer quickly and easily. Some BBS software and BBS enhancement add-ons allow text searching, which ranges from simple to complex. With these tools, a BBS makes a terrific repository of publication back issues, health data, how-to guides, recipes, movie reviews, and much more.

Any type of valuable information you can generate yourself increases the utility of your BBS. Since this information is unique to your system (or to your organization), people have to come to you to get it. Many BBSs have become successful by offering unique news, databases, or other information online. Taking into consideration your theme and purpose, spend some time thinking about what types of information are appropriate for your system that you can generate yourself.

Outside Information

Entrepreneurial and hobbyist BBSs often make online publications available, such as the electronic editions of *Boardwatch Magazine* and *USA Today Decisionline*, and exclusively electronic publications such as *Bell Business Report* and *Eeeek Bits!* Users can come online and read these publications at their leisure. Some are available for a small charge (such as *Boardwatch* and *USA Today*), and others (such as *Eeeek Bits!*) are available free of charge. An increasing number of these publications are being made available. Consult trade publications such as *Boardwatch Magazine* and *Online Access* to find out about the advertising and editorial coverage of publications available online. Call popular existing BBSs for possible candidates to put on your own BBS.

Whenever you place an online publication on your BBS, check to see whether the information can be made available for download. Some publications restrict usage to online display online and prohibit you from allowing users to download the actual data files.

Other Text Information

Most BBSs (of any type) maintain a section of bulletins for callers. Common topics covered in bulletin sections include system news (such as new features), legal disclosures, basic user instructions, BBS histories, and mailing addresses for the BBS. I recommend you create a bulletin section for your BBS and keep the area stocked with these and other types of tidbits you might want your users to know.

If you'll be creating the news and information you put online, there is no problem in doing so. Be forewarned, however, that any information you obtain from other sources most likely needs to be cleared with the author first. If the information is copyrighted, you need written permission on file to post it on your BBS.

In many cases, this permission is easy to get. Several years ago, *PC World* published an interesting piece on computer viruses. I thought this information would be of value to my callers, so I wrote a letter to the editorial department of *PC World*. In the letter, I described what I intended to do (post the article on my BBS for users to read), and I indicated which article I wanted to post. Written permission arrived in a couple of weeks. I transcribed the article to a text file, and it's been posted online for reading ever since. Computer magazines aren't likely to have any problem with such things; expect to have some explaining to do for sources that might not be familiar with BBSs. In any case, always obtain permission first before you post material owned by someone else.

Chat Facilities

Chat facilities don't require much setup on your part; once configured to be a part of your system, chat facilities work with little or no attention or effort on your part. This makes the chat functions of your system (if you use them) one of the easiest parts of your BBS setup job.

Keep in mind that chat facilities are of value only on multiline systems, particularly those with more than 8 lines. With fewer lines, chat facilities aren't very useful except in specialized

situations. Most systems that feature chat are social systems, and it's hard to have a party with only three or four people. This fact rules out chat for most hobbyist systems.

As I said, the most common application of chat is for social systems, most of which are entrepreneurial. In fact, chat can be one of the biggest income generators on such systems, with users spending hours online in chat, all the while running up their bill and spending more money with you.

Business BBSs sometimes use chat as well. It's an alternative to conference calls, which sometimes involve costly connection charges in addition to telephone charges. Scientists, business planners, and others can dial into a BBS and conveniently communicate with one another. Because most BBS chat facilities buffer the comments of users, it's not possible for one user to interrupt another; all the comments of all participants are automatically interleaved when displayed. Some BBS software supports the transcription of these conferences to a text file, which can later be posted for the benefit of others.

Some chat systems for BBSs allow linking, which I discussed with chat enhancements in Chapter 4. If you want to link other BBSs to yours to allow users to chat with others on either system, you need to make these arrangements in advance. Since local systems may be competitive with yours, chat linking works best when you connect with systems outside your local area.

Finally, large BBSs may wish to follow the conference model of systems like CompuServe. CompuServe often has an expert on a particular topic online at a prescheduled time in one of its conference (chat) areas. Users can log on at the prescribed time and ask questions of the expert. CompuServe in particular has had many notable individuals, from computer columnists to corporate presidents, online in scheduled conferences. You may not be able to attract national personalities, but others in your area might be good candidates to bring online in a scheduled chat. Assuming you can get such people online, you'll still need the line capacity and the user base to support such an effort. Don't consider such conferences unless you run at least 32 lines on your system. Smaller line counts simply aren't worthwhile for this type of effort.

If you do have this type of prescheduled "ask the expert" conference, make sure your BBS software supports the tools needed to make it work correctly. You should have the ability to moderate the conference, kicking out users who are troublemakers. Make sure you promote the scheduled event well, and make sure users understand they'll need to be online at the scheduled time in order to participate. Make a transcript available if possible for people who couldn't make it.

Miscellaneous Functions

Finally, decide what miscellaneous functions you want to provide online. As I outlined in Chapter 1, these include a password change function, sysop chat, a terminal configuration function, statistics displays, caller lists, and a who's online function.

Although these functions seem minor, they can be an important element of your BBS. Every BBS software product offers a different array of these miscellaneous functions. Find out what your BBS software has available, and implement what you feel is best for you and your users.

Installing BBS Add-Ons

BBS add-ons can enhance the basic functionality of your BBS in a variety of ways. I devoted Chapter 4 to the discussion of add-on modules, so you should have a good idea of what you'd like to add to your system now, or once you're established.

When you have learned the BBS and it is configured to your liking, you can begin to think about installing the various BBS add-ons you have selected.

Remember when making specific add-on selections to keep your theme and focus in mind. It's tempting to pick add-ons that have personal appeal for you, but that don't pertain much to your BBS's theme or your user base. In most cases, you'll want to pick only those add-ons that have applicability to your BBS.

As I've discussed before, some add-ons install as doors and others install as integrated modules. If the add-on is a door, follow the directions that come with the door regarding memory usage and availability, as well as settings required for your multitasker or DOS environment. If the add-on is a module, make sure you have enough memory available before installing, and follow the manufacturer's directions for the integration of the module. Some BBSs require you to compile the add-on into the source code of the BBS software; if this is the case, you may need to enlist help from a consultant or the BBS software vendor if you're not a programmer.

I recommend installing add-ons for your own use initially. This gives you the time to fully check out a particular add-on before you make it available to your users. Alternatively, you could open the add-on only to a specific limited group at first. However you handle it, take the time to test an add-on before you make it available to callers. This helps you determine whether you've configured it properly and helps you find program bugs or flaws before your users fall into any confusing displays they may not understand or know how to deal with.

Installing Additional Hardware

In most cases, the installation and configuration of your BBS has taken place up to this point with minimal hardware. Once everything appears to be working, you can install any additional hardware you might need.

Check this list to make sure you've gotten everything in place:

- **Serial port hardware** Install additional serial port hardware, up to your initial line count. This may include putting in serial cards, multiport serial hardware, and/or an expansion chassis.
- **Modems** Hook up any additional modems, up to your initial line count. Make sure everything gets plugged in: serial cable, power cable, and telephone line cord (in the modem's jack labeled "line").

- **Specialized interconnection hardware** This includes asynch servers, terminal servers, hard-wired serial lines, X.25 PADs, and so on, as I discussed in Chapter 6.
- **Additional PCs** If your BBS requires multiple computers, install the extra computers now if you haven't already.
- **LANs** If your BBS requires a local area network (LAN), install it and make sure it's working. This includes LAN adapter hardware, as well as the LAN operating system (NOS).

Once any additional hardware is in place, you may need to perform additional software installation steps to get the whole system working together, especially if you run multinode BBS software that requires multiple machines. Follow the manufacturer's recommendations for order of installation if this is the case.

Installing Interconnections

After all software and hardware is put together and appears to be functional, you can consider installing and enabling interconnections—the links from your BBS to its user base in the outside world.

In most cases, this involves the installation and connection of telephone lines. If this applies to you, follow these steps:

- **Call for service** Order the service from your local telephone company (if you haven't already). Agree to a date for installation, and make sure you are available on that date to point out installation locations. Don't forget to order hunt group service if this applies to you.
- **Demarcation point** The telephone company will in most cases simply bring your telephone service to the demarcation point—a crossover point between the phone company's and your responsibility for wiring and maintenance. Make sure the installer tests that all lines are working up to the demarcation point. Have the installer explain the demarcation equipment and how to test your lines at that equipment.

- **Install wiring** Whether you will do it yourself, pay the telephone company, or hire a contractor, run the wiring from the demarcation point to the location of your BBS, and install telephone jacks. Make sure each jack has its telephone number written on it in indelible ink for future reference or in case of line trouble now or later.
- **Test each line** Hook up a standard telephone to each jack, one at a time. Using another line in your home or business, call the corresponding telephone number and make sure the phone rings. This will test to make sure the jacks and lines are installed and working.

INSIDER TIP. . . Phone-Line Hassles

Whether it's Murphy's Law or some other phenomenon, you are likely to experience trouble of some sort during the installation of your telephone service. A single-line BBS may be able to get by trouble-free, but if you're having multiple lines installed, you can expect some level of trouble.

The first area that can be problematic is telephone-number assignments. This takes many forms: the numbers in service don't match the numbers you (or the installer) were given; the demarcation point doesn't have its lines marked with the right numbers; or the jacks aren't labeled with the right numbers. Before contacting the telephone company, make sure the mistake isn't on your end (or the fault of the person who installed the jacks, if not you).

The next area where problems crop up is lines that don't work. Your installer should have checked the lines up to the demarcation point, but sometimes the lines go dead after the installer has been at your location when the telephone company is finishing up installation in its switching equipment. If a line goes dead, check it at the demarcation point yourself (modern demarcation equipment has a regular telephone jack available for this purpose for each line). If it's dead there, call the phone company. If it's not dead there, the problem is in your wiring.

Finally, the single most common problem with BBS telephone installations is a hunt group that doesn't hunt properly. (I described hunt groups in Chapter 6.) When you ordered hunt group service from the phone company, you designated (or were told) the hunting order of your various telephone lines. This is the order in which calls transfer from one line to the next line as your lines become busy. In my experience, this is done incorrectly initially in about 80 percent of multiline BBS telephone installations, so expect yours not to work the first time out, too. Once you've determined that the lines don't hunt in the order you wanted, call the telephone company to fix the problem.

In general, you should allow at least five business days for telephone lines to be installed and set up properly. For example, if you want to open the BBS on the ninth, then schedule installation for the fourth (if not earlier). This will allow you enough time to notice and rectify any telephone-line installation problems that crop up.

Testing the BBS

When you've put the final pieces in place, now comes probably the single most important step of installing a BBS: testing. I cannot emphasize enough how important it is to thoroughly test your system before you open it to your callers.

Most BBSs have various user groupings that each have different access to the system. For example, new users may have different access than a paid user. When you test, create one user account for each of the various access groups you have on your system, then test thoroughly with each of those user accounts. Whether that's two groups or twenty, take the time to test each one completely.

Note that you may need to reset a user account to its default state after each test, depending on your BBS software and the particular operations you're testing. For example, if you test a new-user procedure, the user's access privileges may change after completion of a questionnaire or survey. You'll need to reset those access privileges between each test to see accurate test results.

When testing, keep in mind the following:

- **Error messages** Are there any error messages? Missing files or other components can often generate error messages in your BBS software. Needless to say, error messages are not desirable. Make sure you don't encounter any, and if you do, research, isolate, and rectify the cause.
- **Steps** Are all desired steps working? If a user is supposed to be taken through various steps (such as a new-user registration process) make sure that the steps work properly and in the order you desire. If anything is out of place, rectify the problem, reset the user access privileges (if applicable), and test again.
- **Unwarranted access** Does the user have access to something he or she is not supposed to? This is probably the most important part of testing. If you make a mistake configuring

your system, you could end up with a user who has access to the wrong functions—even sysop functions, if you're not careful. Test everything completely to make sure that users cannot get to any areas or operations that they're not entitled to.

- **Functions** Does everything appear to work right? Test each function available to each test user. Even if the same function is available to different test users, check it for each user. Make sure everything works as it's supposed to, and if it doesn't, determine the cause, rectify the problem, reset the user account privileges (if applicable), and test again.

Testing the BBS involves more than testing the functions provided on the BBS. Other aspects of testing include the following:

- **Check each line** Make sure each line works. Call each and every line on your system from a remote location, or preferably from another line in your home or office where you can see the BBS and its equipment. Does each line answer and connect normally? If not, check connections, setups, and so on, rectify the problem, and retest.
- **Power outage** Kill the power to your whole system, then restart power. If you have everything connected to power strips, switch them off and then back on again, or kill power using breakers or fuses at your electrical feed. The purpose is to simulate a power outage, and then check to make sure the entire system comes back online properly. Careless setups, especially where multiple machines and LANs are involved, can often create a real mess when power goes out, requiring manual intervention. Unless you will be at your BBS or close by at all hours, make sure the system can come back online, with everything working normally, after a power loss. If it does not, investigate what is required to ensure that the system can weather a power outage without causing trouble. With single-computer systems, this is rarely a problem. With multiple-computer systems, you may need to seek advice from your BBS or LAN software vendors on these matters.
- **Automated events** If you have automated events on your system, make sure they work. Many BBS packages offer events—scheduled system shutdowns for automated maintenance such as tape backups. If you have this capability and

decide to use it, make sure it works and that the BBS comes back online afterward. If necessary, change the time on your computer's clock to simulate what would happen naturally if you allowed the BBS to run normally. Mistakes in configuration can sometimes cause problems during these events that you might not find right away otherwise.

- **Burn-in** Allow the system to burn in. Burning in is a technique used by manufacturers of electronic equipment. It refers to the process of allowing something to simply run unattended for a certain period of time, primarily to weed out heat-related electronic failures. Let your BBS burn in for a couple of days after everything appears to be working, just to be certain nothing obvious is going to fail. Heat-related problems can affect BBSs, too, usually with your modems. But burning in can also reveal time-related problems. If the system is still working normally a couple of days after you've confirmed it's configured properly, you should be ready to open your doors.

Opening Day!

If you've made it this far, it's time for opening day—the date you pick to officially place your BBS online for callers to access.

Unlike a retail business, opening day on a BBS usually goes by without much fanfare or excitement (except maybe for you). There are no balloons, no confetti or streamers, and no rush of people through your front door. In fact, you might not even see much activity on your BBS for several weeks after opening day.

Do what you can to get the word out about your BBS. Chapter 9 has some suggestions on how to accomplish this through marketing and advertising.

During the first several weeks the system is online, you'll need to pay close attention to it. Observe that things continue to work properly, that users aren't having problems with any part of the system, and that everything stays up and running. Don't be

surprised if you run into things you didn't find during testing—just work to fix the problems as quickly as possible. During this initial period, your system isn't likely to be used much by callers, so it shouldn't be a problem to have the system offline occasionally to fix things or do further testing.

Most important, hang in there. It's rare that a BBS becomes an overnight success. It's a long-term proposition, so it's critical not to get upset or depressed that things aren't taking off like wildfire. Keep up with it, enjoy yourself, and if you've made the right decisions along the way, you'll enjoy success over the long term.

Summary

After reading this chapter, you should have an understanding of the following:

- The first step to installing your BBS is the physical installation of the BBS software.
- Once your BBS software is installed, you need to take some time to learn how to use it, including loading, unloading, access controls, and system features, and how to make changes to the system design.
- Configuration includes the addition of message areas, file areas, and more, according to your specific needs.
- File areas are one of the most popular features of any BBS. CD-ROM based file libraries are particularly popular with hobbyists and entrepreneurs.
- Configuration includes the addition of questionnaires or surveys to your system, as well as news and information displays. Information can come from third parties, or it can be original material generated by you for the BBS.
- Chat facilities may be a part of your BBS, especially if you're an entrepreneur.
- Once the BBS is configured, you can install BBS add-ons or additional hardware, such as more serial ports, modems,

specialized connections, LANs, and so on. Once all of this is in place, next is the installation of interconnections, such as telephone lines.

- After all configuration and installation is complete, you can test your BBS. This is one of the most important parts of BBS installation. You should allow adequate time to perform all tests.
- When you've tested everything and found it to be working, it's opening day—time to put your BBS online and make it available to callers.

Worksheet 7: Installing Your BBS

When you're installing your system, use the following checklist to ensure all steps have been completed in order:

- ❑ Prepare the machine.
  - ❑ Make sure it boots.
  - ❑ Check disk space.
  - ❑ Clear anything not needed for the BBS.
  - ❑ Check for adequate memory.
  - ❑ Install memory manager (if applicable).
  - ❑ Remove unneeded drivers and TSRs.
- ❑ Install the BBS software according to the manufacturer's directions.
- ❑ Test to see that the BBS software installation was successful. Refer to your BBS software documentation for instructions.
- ❑ Learn the BBS software.
  - ❑ Find out how to load and unload the system.
  - ❑ Determine how to log on as sysop.
  - ❑ Change the sysop password.
  - ❑ Learn how access to the system is controlled.
  - ❑ Learn how to use various system features, as a user would.
  - ❑ Find out how to make small changes.
  - ❑ Learn how to make bigger changes, such as adding or removing a section.
- ❑ Configure specific BBS features.
  - ❑ Add message areas as your needs dictate.
    - ❑ Local
      - ❑ E-mail
      - ❑ Public
    - ❑ Networked
      - ❑ E-mail
      - ❑ Public
    - ❑ Other
  - ❑ Add file areas as your needs dictate.
  - ❑ Create a master file list or install software to do it.

- ❑ Obtain files from other sources as necessary.
  - ❑ CD-ROMs
  - ❑ Shareware
  - ❑ Downloads
  - ❑ Other _____
- ❑ Add any needed questionnaires or surveys.
  - ❑ New-user survey
  - ❑ Other _____
- ❑ Add any news and information sections.
  - ❑ Generated by you
  - ❑ Online publications
  - ❑ Bulletins
  - ❑ Other _____
- ❑ Add chat facilities if applicable.
  - ❑ Linked chat
  - ❑ Scheduled chat
- ❑ Add miscellaneous features.
  - ❑ Password change
  - ❑ Sysop chat
  - ❑ Terminal configure
  - ❑ Statistics display
  - ❑ Caller list
  - ❑ Who's online display

❑ Install any BBS add-ons you may have selected.

❑ Install any additional hardware.

- ❑ Install additional serial ports.
- ❑ Install additional modems.
- ❑ Install specialized interconnection hardware.
- ❑ Install additional computers.
- ❑ Install LANs.

❑ Install interconnections (telephone lines). Remember to allocate plenty of time to allow for errors and delays.

- ❑ Test your BBS for usability.
  - ❑ No error messages
  - ❑ Needed steps work
  - ❑ Access controls work
  - ❑ Functions work
- ❑ Test your BBS's operations.
  - ❑ Check each line
  - ❑ Modems connect
  - ❑ Power restart works
  - ❑ Events work
  - ❑ Burn in
- ❑ It's opening day!

8 Operating Your BBS

Once your BBS is up and running, your job as sysop changes from research and planning mode to operating mode. You need to keep the system running, respond to messages, upgrade users, and be present and involved in your new BBS.

But more than that, you need to have a complete understanding of the deeper issues of operating a BBS, such as ethics, understanding why people call, meeting users' needs, and sticking it out over the long term.

This chapter also provides assistance to entrepreneurial sysops in making their BBS pay. Issues for entrepreneurs to consider include how to charge, what to charge, and accepting payment from your users.

This chapter wraps up by outlining some of the pitfalls of running a BBS, and some of the risks involved in your operation.

Ethics and Operating a BBS

Chances are that before you even considered starting a BBS, you had spent some time online calling other BBSs. Most of us who run a bulletin board can recall the time when we dialed a BBS for the first time. Do you remember when you first called one? If possible, think back to that first call. What were you feeling at the time? More important, can you remember how you perceived the operator of that system?

Most of us viewed (and the majority of BBS users do view) a BBS sysop with some level of reverence and esteem. This is important

for a BBS sysop to remember; your users are looking up to you as someone special—someone knowledgeable, helpful, and friendly. The relationship between you and your users is generally built on trust. Your users trust you not to deceive them. When they look to you for help, they expect you not to mislead them or brush them off, but rather to care about them and to be fair and equitable. In many regards, as a sysop you're a parent, and your users are your children.

Like a parent, you'll get the occasional problem child, but by and large, you are in a position of authority and power on your BBS, and your users are obligated to respect that authority and power.

Similarly, you have an ethical responsibility to respect your users. Many unscrupulous BBS sysops mislead users, violating the implied trust that the sysop/user relationship entails. If you talk to your users, over time you'll hear various stories about terrible sysops who get wrapped up in a personal power trip and use their BBSs to use and abuse their users.

Thankfully, most of the callers to your BBS won't be jaded. They'll give you the benefit of the doubt, trusting you until you give them reason not to. This can be a heavy burden for you. But unless you pay attention to ethics, you cannot be successful or effective in the operation of your BBS. For entrepreneurs, this translates into lost income potential. For hobbyists, it means people will shun your BBS. For the businessperson, it means you're sowing ill will toward your company.

Being ethical is not difficult or complicated, it just requires attention to how you run your system and how you interact with your users.

Earning Users' Trust

Being ethical consists of adhering to laws, both those that are on the books and legally enforceable as well as those unwritten common-sense laws that guide our day-to-day interactions with others.

What follows are some recommendations for earning your users' trust:

- **Walk your talk** When you say you'll do something—do it. If you look at your experiences in life, you'll find that one of the simplest and most common ways that trust is earned is by following through on promises. If you tell a user you will do something, whatever it is, however important or trivial, do it, and do it within the time frame you indicated. For example, if you say you'll post a file to download, get the file and get it posted. If you say you'll extend a subscription to your BBS for two weeks due to some misunderstanding, credit the user as you promised.
- **Money and personal data** Be careful of anything that has to do with money or personal data. Money is a sensitive issue with virtually all of us; users are especially leery of giving a perfect stranger—you—their credit-card number. Personal data, such as home addresses and telephone numbers, are also guarded carefully by most of us. In any cases where money or personal information changes hands between you and your users, emphasize why you are asking for the information, what you intend to do with it, and who has access to the information. Go so far as to explain, even in some detail, exactly why you need or want the information you're asking for. For example, "Please enter your credit card number. We need this information to debit your credit card and collect payment for your subscription fees. This information is held in strict confidence." Don't go overboard, but make it clear to users *why* you need something, not just that you want it. In the same light, I strongly recommend *not* reselling your user list or giving the list to others. Keep the information—all of it—to yourself. Don't share it with others under any circumstances or for any reason.
- **Respect** Treat your users with respect and in a professional manner. You may be the boss of your system, but you don't have to act bossy. I'll talk more about how to treat your users later.
- **Trust** Don't speak out on your BBS. This takes two forms: users and issues. Publicly humiliating users on your BBS (in

messages or bulletins) is a surefire way to instantly lose your users' trust. If you do it to one person, the logic of a user goes, you could do it to anyone. Even if you don't mention names, talking bad about a user can still tarnish your reputation. Similarly, being particularly vocal in a public forum can cause users to lose respect for you. This is particularly risky on sensitive issues. Participate in your BBS, but unless you run it specifically on the topic you're pontificating about, keep your political, religious, moral, and other opinions to yourself; they have no place on your BBS.

The bottom line is to operate your system with honesty and integrity. For most people, this is purely common sense. Just make sure that you check your actions online against what is considered to be ethical and fair. Doing so is critical to your success.

Treating Your Users as Customers

As most BBS sysops do, throughout this book I've referred to BBS callers as *users*. The term is very well accepted, but it does have some negative connotations, especially to entrepreneurial sysops. My recommendation is, whenever possible, to think of these people as your *customers*. That is, after all, what they really are when you run a BBS as a business.

Treating your users as customers is more a mind-set than a label, and one you need to adopt early in your efforts to help ensure that your customers come back for more.

Remember the golden rule: Treat your customers as you would want them to treat you if the situation were reversed. What level of service would you expect if you called a subscription-based BBS? Would you expect personal attention, attentive and quick service, courtesy, and respect? Most of us would.

A BBS makes providing good service especially challenging. It's not like a retail situation; your customer does not stand in front of you, able to see your smile and detect the pleasant tone in your voice. Electronic communication is devoid of these things, leaving raw words the only avenue where information comes

across from you. If you don't take giving good service seriously, it will show in your writing. If you don't take the time to compose messages with some amount of care, your words may be misinterpreted.

One of the most common mistakes I see sysops make is to compose messages that are too short. Suppose someone asks you where a particular feature is located on your system. Let's say a user is looking for your Voting Booth feature and can't find it. She leaves a message to you asking how to get to it. You could handle this question in two general styles:

- "It's in the utilities menu. Go there and hit the V key. Joe."
- "Thanks for your interest in the voting booth. I'd be happy to have you participate. To get there, from our main menu, press U for utilities, then press V for voting booth. You'll be able to select from two or three different voting subjects that change monthly. Thanks again for your interest. Joe Blow, Sysop, Boneless Chicken Ranch BBS."

When you read these two possible replies, how do they make you feel? Although the first example isn't snotty or ill-tempered, it is terse, as though the person who wrote it has no time for such trivial things as a customer question. The second example, which is more verbose, is one way in which you can help users feel that you care about them and their use of the system. Although the second example takes a little more time and effort to compose, it's a wise investment in treating your customers right so they'll be back again, writing checks every time their subscription comes up for renewal.

The bottom line here is to remember at all times that people who call your system are your paying customers. Give them the respect and courtesy that they deserve.

Avoiding Ego Involvement

Regardless of the type of BBS you operate—hobbyist, entrepreneurial, or business—you as the sysop are the boss. You run the system, you make decisions about it, and you decide who gets

access and who doesn't. It's a great position of power, and for many people an exhilarating feeling of authority. Although it's fine for you to recognize your authoritative position, it has no place rearing its ugly head in front of your users.

One quick way to destroy customer relationships with your users, reduce the popularity of your BBS, and give your business a black eye is to be an ego-involved sysop. Users expect to be treated with respect, not indifference. When you allow yourself to have an egotistical, arrogant attitude online, most of your users will be remarkably intolerant of you, vastly reducing the popularity, effectiveness, and profit potential of your BBS.

The trick here is to simply not allow yourself to become short and belittling with your users. Not in messages, not in bulletins, not in help files—nowhere.

Though you may be level-headed most of the time, users have a unique way of bringing out the worst in a sysop on occasion. This is where you will be particularly challenged online to keep your cool and keep your ego out of it. Expect and anticipate that users will from time to time verbally abuse you and your system, complaining about seemingly unimportant details. Pricing, the operation of your system, how you chose to lay something out online, and much more are free game for the user with an attitude. As difficult as it may be for you, try your best to treat even these troublemakers with compassion and respect. Suggest, in the best and kindest way possible, that you understand your system will not meet everyone's needs, and it's not designed to. If you are running an entrepreneurial system, offer to give the user his or her money back. Whatever you do, don't allow yourself to become engaged in an electronic shouting match with a user; it's a battle you will never win.

Understanding Why Users Call

If you ask the average sysop why people call their BBS, you'll get many different types of answers. The biggest surprise, however, is that most of them are probably wrong.

For the business sysop, understanding why users call doesn't involve rocket science or anything nearly that complicated. In fact, business sysops are probably among the few that truly do understand why people call their systems. Most business or organizational BBSs were started to solve a particular problem. Take the case of a technical-support BBS, such as Microsoft's Download Service. People call a system like this to download the latest drivers or informational files. They call because it's the easiest, quickest, and most likely the least expensive way to obtain those files.

For the hobbyist and entrepreneur, it's not quite that cut and dried. You'll find that people call your system for a variety of reasons, and the reasons they state are not always completely honest.

Most BBS callers perceive your BBS as a place to come and visit. Rather than coming to your place in person, they dial it up with their modem and log in. The dynamics, however, are much the same as they would be had the caller come to your home or place of business in person. A friendly, inviting, interesting place to be is a lot more fun and appealing than a place that's hostile or stark. BBSs, especially over time, develop a sort of personality that conveys to users the type of place they've called to visit.

You should spend some time calling other BBSs, in your area and around the country. If you don't ordinarily think of BBSs as a place to be or visit, try to feel and experience a BBS when you call it. How does the system make you *feel*? Is it a hostile place, or a place that makes you want to stay online and investigate it? Make notes about *why* certain things you encounter online make you feel a certain way. With time, you'll begin to isolate particular features, policies, behaviors, sysops, software, configurations, and so forth that have particularly positive effects and those that have negative effects.

Your users may call to download files, to chat with other users, or to participate in their favorite message areas. But more important, they call because your particular BBS offers the features they're looking for in a format and manner that they feel comfortable with.

The object here is not to confuse technical issues with emotional ones. The success and effectiveness of your BBS depends on both

types of issues. Implement the features you need or want, consistent with your theme. Then get in touch with the fact that you, as sysop, are host to your visitors when they dial into your system. In large part, how your system feels emotionally to your callers corresponds directly to how you treat your users, what policies you set and how, and how many barriers you put up for them.

Keeping Users Calling

Once you have attracted users to your system, the object is to keep them.

As I said previously, there are technical and emotional issues. It's easy for most of us to deal with the technical issues, because we can conveniently identify them, categorize them, quantify them, sort them, deal with them. Emotional issues are difficult to deal with. You can't see them, you can't identify them easily. They exist outside of our physical, visible world. Yet they're as critical to your success as any technical issue you can name.

I've seen BBSs that offer precious little in the way of anything tangible—a few message areas on unique subjects, some files, and little else. Yet somehow, the system is alive and active with users who seem quite interested in the system. Why? The BBS is a comfortable and inviting place to be—it just feels nice to be there.

Making your BBS feel good to people is one way to keep users calling. Here are some ideas about how to make that happen:

- **Involve yourself** If you run a BBS, you should be prepared to do what it takes to keep on top of it. How long does it take you to answer a user's message? Are you short with the person when you do answer, or do you take the time and make the effort to pen a worthwhile response? How you attend to your users and the system itself can make a big difference in how users perceive your system.
- **Avoid stagnation** Although some successful BBSs are rather stagnant, it's atypical for that to be the case. Most successful BBSs have a slow, steady evolution throughout their entire lifetime. By the same token, do not allow your system to sit

still too long. Add a message area, a file area, a new game, a subtle redesign in system menus—anything that gives your users the perception that your system is alive, vibrant, and attended to.

- **Avoid shocking changes** Although slow and steady change over time is good, shocking, sudden, or major changes are not; rather, they're an easy and quick way to alienate your users. Some types of major changes are inevitable, and stable, popular systems can often weather them with only temporary damage. But significant shocks, like changing the BBS software you run, can often be a death warrant for your system. Shocking changes are not always fatal; a lot of their impact depends on why you made the change and how you present it to your users. Again, on occasion, you simply can't avoid a major change. In this case, simply explain to your users you'll be making a change (before you do it, not after), and explain why you feel the change is important.
- **Avoid barriers** A barrier is anything you implement on your system that makes it difficult for a caller to do something. This is especially critical with regard to new users. If someone has called your system for the first time and it takes 15 minutes of questionnaires, surveys, rules, policy listings, pricing information, and more just to reach your main system menu, you've put up a huge barrier that will turn off a huge percentage of potential supporters. Even after users are online, make sure you don't bury things on your system or make it difficult to get around. Poor design and layout of your system can form a barrier, too.

Coming for One Reason, Staying for Another

Many times, you'll find that users are attracted to your system initially for a particular reason or set of reasons, and that over time, those reasons change.

I know of a BBS that was set up to offer discussions of a political nature. Message areas were created, the system was promoted, and over time it gained a tremendous following. Upon closer

examination, however, one of the most popular features on the system was the elaborate collection of files that the sysop posted online and allowed users to download. Although the system offered what it set out to offer, the feature that really kept users coming back for more had nothing to do with political discussion at all. Over time, the system evolved into a more broad-based one offering even more elaborate file areas to its users.

This transition of a system from one focus to another is not uncommon. Although you have to set goals, create a theme, and live up to the focus you selected when you started your system, you must remain open and alert to the fact that users may have a different agenda than yours. Truly successful and effective BBSs and their sysops adjust to these changes.

Adjusting to these changes doesn't mean you have to sacrifice the reasons you started a BBS. Rather, it simply means that you should be open-minded to expanding your own horizons and that of your system by moving with the tide instead of trying vigorously to hold your ground.

When you make adjustments, you need to be somewhat careful not to remove features that may still be an integral part of what makes your system what it is. You may be tempted to take some things off-line, sensing that people don't use them anymore. Remember, users often perceive your BBS as a place to be. By carelessly taking something off-line, you could very well be eliminating an integral part of that sense and feeling of place users have in their minds about your system.

A Sense of Community

Over time, many BBSs develop a strong and loyal following, and often users become quite bonded to your system. This sense of community works to your benefit, because once a user has joined with other users on your system, they'll not likely leave your system and stop calling. For the entrepreneur, this translates to a constant and increasing income level.

Some BBSs are more conducive to this sense of community than others. If yours is open to the public, help foster communication

among your users. Make sure there is a message area (or multiple areas) where people can talk about subjects consistent with your theme. Join in with your users publicly; often when you start a conversation with your users, others will join in. If chat (teleconferencing) is appropriate on your system, make sure users know it's available and how to use it.

As I've mentioned before, many of the advantages of BBS technology arise from the fact that it is largely free of the prejudices that are a part of face-to-face communication. However, many BBS sysops help create a sense of community and help to form strong bonds among users by hosting physical get-togethers on a regular basis, such as a picnic or informal gatherings at a restaurant or bar. These live gatherings help surmount some of the shortcomings of a BBS, bringing a sense of reality and wholeness to the potentially incomplete, shallow communication the electronic world offers. I've known systems that have gatherings as frequently as each week, to the ultimate benefit of users—and the bottom line—by solidifying the relationship between the BBS and its user base.

Charging for Access

Charging for access to your BBS is what separates a hobbyist BBS from an entrepreneurial BBS. Some business BBSs also charge for access. Charging for access and handling it properly is key to the entrepreneur, since the BBS *is* your business, and for your business to succeed it must generate income.

There are many aspects to making a BBS pay. You must charge properly, price your product fairly, adjust your prices when necessary, accept many different forms of payment, offer something worth paying for, and ensure that people keep sending money (renewing their memberships). This section will cover important aspects of charging for access to your system.

Charging Properly

Proper charging involves selecting a method and structure for pricing your BBS that is appropriate to your situation and acceptable to your users. Since this is a vast issue, I'll cover it in detail in a later section. For now, understand that selecting a particular method for charging is yet another area that users will be sensitive to, and that therefore affects your success.

Pricing Your Product Fairly

Anyone who sells anything struggles at one time or another with the issue of pricing, and rightly so. Charging too little means you're robbing yourself and your bottom line of money you could be getting but aren't. Charging too much means you may be locking out a significant number of customers who'd be happy to pay if your rates were just a little more within their reach.

To confuse matters, as a business owner you'll hear comments from your users about your prices. You can't pay too much attention to these comments, however. Think of your own situation. Wouldn't you prefer it if everything in life were free? Sure you would! But life doesn't work that way, and neither can your business. Users will always want you to charge less (or not charge for access at all). Take such comments with a grain of salt.

One way to arrive at fair pricing is to call comparable BBSs in your area, or in other areas of the country. What do other systems charge for about the same level of service and features as you provide? If the other systems you call have been successful, then you'll have a good idea of what it's taken for them to succeed.

Don't be too afraid to adjust pricing you arrive at in this manner. Just because your direct competition charges a certain amount for their system, if you feel you offer a better product, charge more for it. Over time, users will recognize and understand the added value you're giving them that your competition is not, and they'll perceive your pricing as fair. The bottom line is that you do not have to compete on the basis of price alone, even in today's value-conscious world.

Another way to determine pricing is to base it on your cost. If it costs you $500 a month to operate your system, then you know you'll have to be bringing in that much to cover your costs, and significantly more in order to generate a profit and to expand your system. This is only realistic once your system is established, since you won't have much of an idea of how many people will actually subscribe until your system is online.

The most important aspect of pricing is to believe in the product you're selling. If you don't believe that your BBS is worth charging for, you may as well hang it up right now. Only by believing you are offering value to your paying customers can you possibly be able to charge, charge fairly, and be successful. If you don't believe you have a good product now, take the time to figure out why not. Be fair and objective with yourself when making this judgment, and don't be too hasty to write yourself off or too quick to think you're offering the best BBS ever, as reality most likely lies somewhere in between.

Adjusting Your Prices

Once your system is up and running and you've met with some level of success, you may want to adjust your prices to reflect changing conditions. Many sysops find they are charging too little; although their systems have caught on, they find that their cash flow isn't sufficient to get the bills paid. Others find that there is a lot of interest in their system, but few people actually send payment. In both cases, it's time to adjust the pricing.

Pricing adjustments must be made carefully to avoid rapidly throwing off the balance by moving too far in one direction or the other too quickly. In the case of price increases, the adjustments must be made slowly as well to avoid upsetting your users excessively. If you need to double your income, the way to do it is *not* by doubling your prices overnight, a strategy that will backfire in the form of lost memberships in wholesale quantities.

If you choose to increase your price, I recommend you try to keep price increases to no more than 15 percent per year, less if you can manage it. In large part, how much you can increase

your pricing depends on how you charge (which I'll discuss later). If your fees are relatively small, you can get away with larger percentage increases, because the numbers are still small. For example, if you charge $20 for a three-month subscription, a 50 percent increase makes it just $30, which isn't perceived by most users as much of a big deal. However, if your annual subscription is $100, then a 50 percent increase to $150 seems like a huge amount of money in comparison, even though the increase was the same 50 percentage.

When you increase prices, the object is to avoid making it appear as though you're gouging people. Users will almost always complain about price increases, and you'll always have a few who refuse to renew their membership in protest. Try not to take these irritants too much to heart. By the same token, if users stay away in droves, you know you've made a serious mistake. This should happen only if you've not taken my advice to keep price increases small and steady over time.

Price reductions can be done at will. Whenever you decide you want to reduce prices for whatever reason (to stimulate user interest primarily), figure your new prices, and put them in effect. Although not as critical as with price increases, I'd recommend keeping price reductions small. You can always reduce them more later if need be.

When you reduce prices, don't miss a marketing opportunity. Tell users that you're reducing prices because of the overwhelming success of your system, and you want to encourage more people to join the fun—add whatever is appropriate to your situation. This is your chance to be creative. Use it!

Another way to adjust prices is to change the way you charge users for access. If you've been offering only annual subscriptions, try adding new three-month and six-month subscriptions, or a per-hour charging method if you wish. Different types of charging can be used as an easy and simple way to disguise price increases and raise profits, getting more money for the same access. And you do it all by simply changing the packaging and presentation to your customer.

Accepting Payment

To make money, you have to be able to collect it from your customers in the manner they wish to give it to you. This means you must accept not only a check or money order, but also their credit cards, preferably as many different credit cards as possible.

The subject of credit-card acceptance is a vast one, and I will discuss it specifically in a later section.

For collecting check and money-order payments from your users, I recommend opening a post office box at your local post office. There are also private mailboxes operated by independent companies. Use the post office if possible, since it offers the added sense of confidence that the post office personnel are the only hands touching your mail. Keep in mind that you must provide a street address for the post office's files, and since you are operating as a business, this information is available to the public on demand. (Private mailboxes have no such requirement, which is one benefit to going that route.)

You'll need to make sure you have a checking account open in your company's name (usually the name of your BBS, unless you've set up some other structure). This allows you to process checks and money orders made out to your BBS. Some banks allow you to complete a *tradestyle resolution* that allows you to deposit checks made out to your company into your personal accounts. In either case, you will probably need to provide your bank with documentation that you are a legitimate business. Contact your state's revenue department or small business division (if you have one in your state) to determine what licensing is required. This is often no more complicated than registering your business name with the state.

I've seen many BBSs that ask users to make out checks to "Cash" or to "Bearer" instead of the name of the BBS. This makes the check a bearer instrument and allows the sysop to cash or deposit the check to his or her account with some anonymity. This practice is perceived by most users as fishy, and I don't recommend it. If you're not willing to start a company for your BBS and operate under that name, then you really don't have much business

asking users to pay for your service. If you want to do this because you've got something to hide, you should seriously reconsider your motivations in running a BBS.

Instant Access

When a new user calls your system, and within the first few calls decides to subscribe, you've got a hot prospect. Your mission at that point is to ensure that he or she doesn't get away without being able to spend money with you.

Unfortunately, this concept is lost on many sysops I've encountered. It's lost, because these sysops make the fatal mistake of making it difficult or time-consuming for that prospect to spend their money by having all kinds of things to fill out online, waiting periods before access is given, too many rules to read, and so on. Remember, your object as sysop is to make it as simple and quick as possible for your customers to spend their money with you.

The most critical mistake many sysops make is implementing a waiting period. When a caller gives a credit-card number online, there's no reason whatsoever not to provide that user with immediate full access to your system. Although a waiting period is reasonable if you're waiting for a customer to mail you a check, there's no logical reason not to give access to your system instantly for credit-card payers.

Many sysops implement these waiting periods anyway so they have a chance to clear the credit card before the user gets any access to the system. The logic of these sysops, which makes sense on the surface, is that they want to weed out bad credit cards without letting anyone get free access to the system.

But if you think about it, if this does happen, what have you lost? In most cases, if you attend to your system regularly, you can run your credit-card charges once a day (if not more often). If someone logs on yesterday and gets access to your system, and you find out today that his credit card is bad, you've lost only a day's access to your system by that user, which in most cases is simply no big deal. You lower the user's access until the matter is resolved.

When someone pays with a credit card, provide instant access. Doing so eliminates another barrier to making your BBS successful and profitable.

INSIDER TIP. . . Getting Renewals

When it comes time for users to pay additional money to maintain access to your system—that is, renew their membership—it's time for you to go out for the business. When users first call your system, they'll want full access to it and are therefore motivated to send money right away so that they can gain access. When it's time to renew, they aren't quite so motivated. They already have full access (for the moment), and it's a human tendency to put things off. It's your job then to make sure your users understand it's time to renew and send money in order to continue enjoying your system.

You should handle renewals the same way a magazine does. Well in advance of a user's expiration date, send a notice alerting him or her to the fact that the BBS membership is about to expire. Tell your user what it costs to continue, and offer several renewal options (if that applies).

Here is another marketing opportunity for you. Make sure your renewal materials outline the benefits of continued membership. Let your users know all they'll be missing out on should they let their membership expire. Loyal users already recognize the benefits—this serves to make sure they haven't forgotten any of those benefits.

Don't stop at one mailing. If a user doesn't renew with the first mailing, make sure he or she gets at least two more mailings, spaced at logical intervals. It's entirely possible that person misplaced your first mailing, or just never got around to it. That doesn't mean you've lost a customer, if you keep pursuing the business.

If a user does expire, lower or remove his or her access to your system (depending on your procedures and policies), then don't let it end there. Make sure expired users have an opportunity to subscribe again by sending out at least one more mailing after their expiration date is reached. If you can afford to do so, contact expired accounts by mail a few more times until six months to a year has passed, or they've broken down and sent you money. Don't hesitate to make special offers to these former customers; make sure they know how much you valued their membership, and make sure they know they're getting a special offer due to their past support.

Selecting an Appropriate Charging Method

There are many ways you can go about charging for access to your system. This section will cover the most prominent charging methods, along with advice on which types appear to work best.

As you assess the various methods of charging, be certain you don't pick a charging method or a fee schedule that costs more to implement than you make. Some types of charging (like the commercial online service model) and/or fees that are too low can often lead to you spending more time and money tracking and billing users than you actually earn in dollars. If you charge $2 an hour for access to your system, but it costs you $2.25 to record, track, account, and generate bills for each of those hours, you've just lost 25 cents an hour on the deal. Make sure the charging method you pick and the rates you charge don't lead you straight into the poorhouse with tracking and accounting overhead.

All the various popular methods of charging for BBS access fall into five categories called *models*, since almost all of them are modeled after what other services or industries have found to be successful. Table 8-1 shows the five charging models, along with how effective each one is and how much work is involved on your part to handle payment collection. Each is discussed in more detail in the sections that follow.

Table 8-1
BBS Access Charging Methods, Effectiveness and Level of Effort to Collect Payment

Charging Model	Effectiveness	Level of Work
Magazine	High	Low
Commercial Online Service	Low	High
Modified Commercial Online Service	Moderate to High	Low
900/976 Number	Low to Moderate	Low to Moderate
Contribution/Guilt	Low	Low

The Magazine Model

Generally, following a magazine model has proven to be the most effective and profitable way to charge for access to a BBS. In essence, users subscribe to your system as they would a magazine, selecting from a tiered rate structure tied to the length of their subscription. Shorter subscription periods cost more per month than longer subscriptions, giving an incentive for users to send more money now in exchange for not having to worry about sending more later.

Unlike a magazine, however, BBSs don't normally use a strictly annual subscription format, with users picking between one-, two-, or three-year subscriptions. Most users have trouble paying for such long periods of time, unsure you'll be online long enough to live up to your end of the bargain. It's best for you as well, since you may wish to adjust your rates as you gain more experience with your system, and carrying users who paid when you had lower rates means less income for you. The other benefit for you in shorter subscriptions is a more regular cash flow, which can be critical to your fledgling business.

Most successful BBSs I've seen offer subscriptions of one month, three months, six months, and one year. Sometimes two-month and nine-month tiers are added. The purpose of the one-month subscription is to have a way for users to sample your system without perceived risk. The rest of the choices are real subscriptions, offered in a variety of increments that allow users to select a level they're comfortable with.

The magazine model is one users can readily relate to, which is why it's so popular and effective. When you're using this model, it's best not to play too many games with how much access a user gets to your system. Pick a reasonable amount of access (privileges, time allowed online, and so on) and stick with it across the board. The only variable should be the length of the subscription. (I'll talk more about keeping pricing simple later on.)

When you follow the magazine model, be aware that some users will seem to take advantage of you. Think about a magazine. Some subscribers barely read each issue, throwing it on the

coffee table after they've read an item or two. Others scour the magazine front to back, reading everything including the advertisements. You will observe these variations in your BBS callers as well. Some people will cheerfully subscribe and renew, yet they'll spend an hour online each month. Others will use their entire time allotment each day, and complain to you that they need more time. Bear in mind that there is representation among users for each extreme. The object is to balance them out, making your average callers able to see and do what they want online, for a reasonable time each day, week, or month, and be able to do it for a reasonable cost. You may have to tune the amount of access you give your users to optimize this average.

The Commercial Online Service Model

When potential sysop entrepreneurs look at the online world, they look for examples of success. One example that's hard to ignore is that of commercial online services, such as CompuServe, GEnie, or Delphi. These systems generally have some form of per-hour charges, usually tied to a minimum monthly fee for basic access. The thinking goes that if these systems are successful charging by the hour, that's how a BBS should charge for access.

Unfortunately, the argument is somewhat flawed for a few reasons.

First, all major online services are available in most areas across the country (and throughout the world, in some cases) for just a local call. The hourly rate reflects not only the cost of providing the available services, but also the cost of being connected long distance to their computer center. Unless you too are providing such access, hourly charging doesn't make much sense.

Second, most BBSs can't come anywhere close to the level of service and features offered by a commercial online service. You may be able to compete in many areas, but it's extremely unlikely your system will ever be the one-stop "we have it all" online source that a major online service can be.

If you adjust your hourly rate to compensate for these differences between you and a commercial service, you're left with a charge that, when reasonable, is somewhere around a dollar or less per hour in most cases. In rare situations, what you offer on your BBS may be so unique and valuable that you can charge more than that, sometimes much more. But for the average BBS, if a reasonable hourly charge is only a buck or two an hour, you've got other problems to contend with, like achieving profitability.

When you charge by the hour, you have added more overhead to your operation. You have to bill your users for the hours they've spent online, and that increases your cost in the form of paperwork and processing. Even if you collect a credit-card number up front to charge access to, you'll have to run those charges every period (usually each month). You'll also need to create and mail statements to users so they'll be informed of what they've used that period and how much you've debited their credit card for. All of this work drastically increases your cost to provide the service, making it unlikely that the low hourly fee you can get away with will actually cover what you need it to cover.

Systems that use this method usually charge more per hour for higher-speed access, just like the commercial systems do. This can be a problem for some BBS software that isn't designed to handle different rates for different modem speeds.

Few BBSs have become successful using this charging method.

The Modified Commercial Online Service Model

This method of charging works exactly like the regular commercial model, with one exception. Users are still charged by the hour for their connect time, but rather than billing them after they've used time online, you make them buy blocks of time in advance and use the time at their leisure.

This rather simple modification of the commercial model has proven itself effective for many BBSs. You offer various time blocks for purchase, and if you wish, you can reduce the cost if a

user buys bigger blocks of time up front. You are freed of the responsibility of billing users for their time online; you merely process their purchase when it happens, and users buy more time when they need it.

Using this method is dependent on your BBS software's ability to handle this type of charging. You should ensure that your BBS allows users to be authorized for a particular chunk of time, and that the time can be decremented as it's used.

One of the more common variations of this method is to vary the per-hour rate based on connect speed. Here again, the BBS software you pick can affect whether it's possible to have this type of charging.

The 900/976 Number Model

Some BBSs have dabbled with 900 numbers or 976 numbers for access to their systems, much like the adult conversation services, psychics, sports scores services, and so forth that these numbers are normally associated with. As I discussed in Chapter 6, charging in this fashion can take one of two forms.

First is direct access. Users dial a 900/976 number to connect to your system. The charges are billed to the caller's telephone bill.

The second form is indirect access. From their regular telephone (rather than modem), users dial a 900/976 number and interact with a voice-response system. The system dispenses an access code, billing some set cost to the caller's phone bill. The user then dials your BBS (using a regular phone line), enters the access code received from the voice-response system, and receives some number of credits or some period of access time in exchange.

Although some BBSs have used this method of charging for access with varying levels of success, it's generally not the optimal method. There are many reasons for this, cost and stigma being the top two.

For those who use indirect access, setting up such a system to collect charges from your users is an investment itself. In most cases, you purchase the voice-response system and special

software for your BBS to exchange an access code for credits. This additional investment means you have even more equipment and software you have to pay for.

But no matter how you charge with a 900/976 number, there is a stigma attached to these numbers that may discourage their use by your callers. These numbers are also perceived as expensive, regardless of what you actually charge.

There is additional overhead for you as well. Your telephone company or long-distance vendor will take a percentage of your profits, a flat monthly fee, or both, to provide this service to you. These costs can be substantial, reducing the amount you stand to net from operating your BBS with this charging method.

If you choose to look at 900/976 numbers for your BBS, proceed with caution and research other systems that charge this way to determine how successful they are at it.

The Contribution or Guilt Method

Some BBSs don't directly charge for access at all, but rather encourage users to donate money to the system. Often, these contributors receive greater access privileges in exchange for sending their money.

This method is only of value to hobbyists who might be looking for help with the phone bill or buying a new modem, and even in that case it is largely ineffective. For entrepreneurs, this method will not generate sufficient income to bother with. When given an option between paying and not paying, most people will prefer not to pay, no matter how big a guilt trip you lay on them.

And therein lies one of the flaws with this method. When you solicit contributions to your BBS in this manner, the general perception among users is that you're begging. The ensuing guilt is supposed to generate money. Guilt may work for charity telethons, but it won't work in any meaningful way for your BBS.

My advice is to skip this method entirely, as it's unprofessional and will put off many of your users. If you want to charge for access to your system, charge using one of the preceding methods.

If you don't want to charge, then don't bother asking for contributions, either, as the volume of people who'll come through for you is tremendously small.

Keeping Pricing Simple

One way to make your operation less effective and less profitable is to make it confusing for users to understand your pricing structure. A complex pricing structure is also more work for you to keep track of and more difficult for you to plan. It is therefore in your best interest to optimize your pricing structures for your own benefit, if not your users'.

Most sysops scale their pricing depending on how much time or how long a subscription a user buys at one time. The more they buy, the lower the cost per unit (month, hour, and so on). It's a natural tendency to want to provide differing levels of access to your system as well, such as greater privileges, more time online per day, more downloads, or whatever, in exchange for more money. When you couple price adjustments based on quantity, and price adjustments based on privileges or access, you can quickly spin a web of pricing that is impossible for users to assess easily. These types of complexities form a barrier that will make them less likely to buy.

Your job should be to reduce the number of choices your users have to make to the smallest number possible, preferably to just a handful of options. If you feel you must offer varying levels of privilege or access to the system, then reduce the number of other choices they have to make to compensate (offer only two or three subscription lengths instead of several, for example).

Here is an example of a fairly straightforward rate structure:

- Level 1 Membership = 60 minutes per call, 120 minutes per day, 2Mb downloads per day
- Level 2 Membership = 90 minutes per call, 240 minutes per day, 8Mb downloads per day
- One-month membership: Level 1 $10, Level 2 $20
- Three-month membership: Level 1 $25, Level 2 $40
- One-year membership: Level 1 $60, Level 2 $100

INSIDER TIP. . . Offering Free Trial Access

Many sysops find that offering free samples helps generate income for their system. It's no secret that free trial offers and samples work, and work well. Price/Costco, a national membership warehouse, offers up to a dozen samples of different food and beverage items to its customers each weekend, although it costs money in staff and inventory to do this. Why? Sales of the sampled products increase dramatically and immediately. You too can offer samples of your BBS to potential customers, and you'll end up converting more callers to customers as a result.

One of the challenges of free trial access is limiting the users' access to the system's features, while allowing them to get a good enough taste of what you have to offer. The object of a free sample is to make your product (the BBS, in this case) look and feel as appealing as possible. If the sample is good enough, it's hard for most people to resist buying more. You may have to work at and adjust how much access is provided to free trial callers to optimize its effectiveness. Try varying the amount of time free trial users are allowed to stay online, and what specific features they can access.

In any case, make sure that trial users at least *know* about everything you offer, even if they don't have access to everything as a trial user. Mail follow-up promotional materials to trial users to tell them more and give them another avenue by which to subscribe.

In this example, users have only two decisions to make: which membership level they feel is best for them, and how long a subscription they want, for a total of six choices in how much money they want to spend. It's natural to want to have more choices available to your users, and in fact, you may receive some complaints from users for not having more. But here again, stay focused on the goal. The object is to get users to pay, not to overwhelm them with choices. The more choices you have, the more frustrated users become, and the more work you have to do to track the results of your efforts.

Accepting Credit Cards

In the United States and other developed countries, we've grown into a society that enjoys and expects immediate gratification and ultimate convenience. For better or for worse, people want things, and they want them *now*. As a business owner, it's your job to offer the products you have for sale in the most convenient

way possible in order to maximize your profits. Part of this convenience is the acceptance of credit cards.

Some BBSs have reached some level of success without accepting credit cards, and it is possible to run a BBS for profit without it. But many of those that have been successful without credit cards have come to realize that the profit potential of their systems increases exponentially when they offer credit-card payment to their users. When systems start out charging for access without credit-card acceptance, it's not unusual for gross income to jump from 100 percent (double) to 1,000 percent (sometimes more) overnight when credit-card acceptance is added.

Accepting credit cards involves getting a *merchant account*, a special account normally obtained through a bank. Once you have a merchant account, you can accept credit cards for which you have such an account. You may need to open multiple merchant accounts, one for each major type of credit card you want to accept.

Why It's Difficult to Get a Merchant Account

Getting a merchant account will likely be the biggest challenge you face in launching your BBS. The reasons are fairly simple when you understand how a merchant account works.

When you accept a credit card for payment, the transaction involves a trust and a promise. The person presenting the card promises to pay his or her credit-card issuer when the charge appears on the statement, and you trust that the person is who he or she claims and will in fact pay the bill when it comes and not protest it. The vast majority of the time, credit-card transactions work perfectly to the satisfaction of everyone involved.

The transaction can go wrong in several ways, however. The credit card could be stolen. The person presenting it is not the person the card was issued to. The person could protest the charge when it shows up on the bill, claiming the charge was not authorized by him or her.

Modern credit-card acceptance involves always checking the card with an authorization center. Doing so covers many of the

more common types of problems, such as stolen cards, expired cards, cards whose owners have charged over their credit limit, and so forth. Just because a particular charge is authorized by a center, however, does not ensure the transaction will go through. The card could still be stolen or otherwise be fraudulent.

If the charge was made by someone other than the person the card was issued to, if the owner of the card decides to protest the charge, or if the charge is in any other way fraudulent, you as the merchant lose. Such situations are called a *chargeback*, meaning that the charge is debited (removed) from your bank account. You then must work the situation out with your bank or merchant center as to who was in the right and who was in the wrong. In the meantime, you're out the money until the matter is solved.

These situations incur costs to the credit-card processors. They're in the business of processing charges—not customer complaints and chargebacks. They make money on the charges, but *spend* money to handle chargebacks. Merchants who are in an industry or meet certain criteria that a processor feels would incur a higher than normal risk of chargebacks are not likely to be given merchant accounts. Merchant accounts can also be taken away if chargebacks are a problem. Particularly problematic are chargebacks that are protested (you as a merchant say the charge was legitimate, the card holder says it's not), since they incur even more work (and therefore cost) for the card processor.

Credit-card processors have found that (among others) two types of businesses have a higher than normal incidence of chargebacks: home-based businesses and mail-order businesses. A BBS is classified as a mail-order business, since the person making the charge has not come to you in person to make his or her purchase. Many BBSs are home-based, making it doubly difficult to get a merchant account. Difficult, but not impossible.

Where and How to Get a Merchant Account

Merchant accounts for the two most common credit-card brands, Visa and MasterCard, are normally obtained through the bank

where your business bank accounts are located. This is where you should begin your search for a merchant account.

If you have not already started a relationship with a bank officer, now is your chance. In most cases, you'll have to deal with a bank officer or president to be approved for your merchant account. The reason is that you are a high-risk merchant (as I mentioned previously), and the bank must guarantee your charges to the card issuer(s). This guarantee is, in essence, a form of credit. Should you default on your part of the deal, the bank will be liable. The bank must therefore feel comfortable risking some of its money on you.

Be prepared. Remember, you are a businessperson, so act and dress like one. Dress like you know what you're doing. Men should wear at least a tie and dress slacks, if not a suit jacket as well. Women should wear suitable business attire. Don't walk into the bank wearing a T-shirt and a pair of shorts expecting the world from your bank, because you're not likely to get the time of day. Table 8-2 provides some general guidelines on the appropriate personal appearance when you're preparing to visit your banker.

Prepare yourself in advance. Make sure you're ready to explain what a BBS is; why people call them, what is it you're selling, how and why; and have paperwork with you to use as visual aids, such as promotional materials for your BBS, a copy of *Boardwatch Magazine* (or even this book) that you can use to show that you're part of a vibrant industry, and anything else you think might help your case. Call ahead to make an appointment, and to explain that you want to discuss the possibility of a merchant account. Then be on time for the appointment. If you have a formal or informal business plan, take a copy with you. (I discuss business plans in Chapter 10.) Be prepared to leave copies of all the material you brought with you.

The object of the meeting is to demonstrate and prove that you are a legitimate business owner, running a legitimate business, and that you know what you're doing. Know what you're going to say in advance, and how you're going to say it. In essence, you're making a presentation here, so plan it and practice it in advance.

Table 8-2
General Guidelines on Personal Appearance to Use when Approaching Your Bank for a Merchant Account

Men		Women	
Don't:	*Do:*	*Don't:*	*Do:*
Wear sneakers	Shower	Wear sneakers	Shower
Wear T-shirts	Wash and style hair	Wear T-shirts	Wash and style hair
Wear sweats	Freshly iron clothes	Wear sweats	Freshly iron clothes
Wear jeans	Wear dress slacks	Wear jeans	Wear slacks, skirt, or dress
Wear worn clothes	Wear a tie	Wear worn clothes	Wear a clean blouse (if not a dress)
Wear soiled clothes	Wear a clean dress shirt	Wear soiled clothes	Wear a suit or other appropriate jacket (if appropriate)
Wear clothes that don't match	Use breath mints	Wear clothes that don't match	Use breath mints
Wear clothes that don't fit	Polish and wear dress shoes	Wear clothes that don't fit	Wear clean dress shoes
Wear bright colors	Wear a suit jacket if possible	Wear bright colors	Wear appropriate hosiery or stockings
Wear wrinkled clothes	Wear dress socks (not athletic socks)	Wear wrinkled clothes	Apply light, tasteful makeup
Use strong cologne or strongly scented hygiene items	Pay attention to all aspects of personal hygiene	Use too much makeup	Pay attention to all aspects of personal hygiene

Don't get too concerned if you don't succeed the first time. Don't hesitate to ask the banker why he or she decided not to issue you a merchant account. Refine your presentation if necessary, and try another bank in your area.

Merchant accounts for cards other than Visa or MasterCard are normally handled directly with the card issuer. American Express, Diners Club, Carte Blanche, and Discover constitute the remainder of the major credit cards, and all are generally handled directly (though there are exceptions). Contact these card issuers directly for merchant account information. Setting up a merchant account for these cards can often be handled by mail.

Alternatives to Banks

Banks are not the only place you can get a merchant account. Although few in number and not always easy to find, some

third-party card processors exist and some of them actively seek to provide BBSs with merchant accounts.

You need to be somewhat careful when shopping for third-party processors. In most cases, a company is not permitted to process credit-card charges for others. The number of legitimate third-party processors is small. If you find a third-party processor and want to do business with it, ask how it can process charges for you, and who has authorized it to do so. I recommend getting references if possible, and take the time to check them out.

One of the more popular authorized third-party processors is Teleflora CreditLine. Teleflora is a large organization best known for floral services. The company entered the credit-card processing business for the benefit of its floral clients, and today it offers the service to others. It has been particularly aggressive in marketing to BBSs, and it is one of the few organizations you'll encounter for a merchant account that actually understands the BBS industry and won't question you about it. (Contact information for Teleflora can be found in the Appendix.) Teleflora processes Visa, MasterCard, Diners Club, and Carte Blanche in its regular merchant plan. It can also process charges for American Express and Discover if you already have merchant accounts for these credit cards.

Understanding Credit-Card Terminology

Many special terms apply to credit-card acceptance. One term you're likely to encounter when exploring credit-card merchant accounts is *discount rate*. This is the percentage of the *ticket amount* (the amount of the charge) that the processor takes as a service fee. Generally, high-risk merchants (such as a BBS) receive higher, less attractive discount rates than other types of businesses. Once your business is established and you have a good track record as a credit-card merchant, you may be able to shop for lower discount rates at other banks or with other processors.

Your processor may want to know your *average ticket amount*. This is the average dollar amount of the charges you process. If

you're a new business, you'll have to estimate the value. Some banks may charge higher discount rates for lower ticket averages. Others base your overall discount rate on the average ticket amount for the month. Make sure you ask how this is handled.

You may be required to purchase a *point of sale terminal* (also known as a *POS terminal*) or other type of *electronic ticket capture*, such as special computer software. You will use the device or software to submit your charges and obtain authorization codes for transactions. These methods of submitting charges allow the charges to be handled in a paperless fashion—everything is handled electronically. Some banks and processors still offer the old-fashioned method of submitting charges, where you send copies of paper charge slips.

All credit-card merchants have a *floor limit* they must adhere to. The limit refers to the maximum dollar amount a charge can be before you call for an authorization number. The floor limit varies with the credit-card brand. Merchants who use a POS terminal or electronic ticket capture effectively obtain an authorization on every transaction and rarely need to make a special call for an authorization. Otherwise, you must adhere to your floor limit, or your bank or processor may refuse to honor the charge.

INSIDER TIP. . . Immediate vs. Delayed Processing

Credit cards can be processed one of two ways in the BBS environment: immediate or delayed.

Immediate processing means that credit-card purchases are made by your users online. Your BBS or a special software option for the BBS runs the credit-card transaction while the user is still connected to your system. If the charge goes through successfully, then the software immediately authorizes the user for access to your BBS. If the charge is declined, the user is not allowed to have access.

Delayed processing means that if a user enters credit-card information online, the information is merely stored, and you process the charge later on manually.

Just as there are two types of processing, there are two schools of thought on this subject. Many sysops feel that immediate processing has advantages in that you'll never give away any access to the system. Every new user who has called is immediately legitimized before being provided access.

BBS operators like yourself are in a unique position in that you're not selling a tangible, physical item. If someone charges his or her membership to your BBS, and for some reason the charge is not honored, what have you really lost? Just access time to your system. Although it's annoying, you're not really out any real money or property. Most sysops feel that immediate access doesn't really provide a benefit, and that delayed manual processing is adequate. There is one more benefit to delayed processing—users don't have to wait for the charge to be processed, which is one more hurdle. And if the charge doesn't go through for some legitimate reason, a machine probably doesn't know how to handle such a special case; had you run the charge manually, this would not pose a problem for the user—you could just try again later.

Don't go to great lengths to obtain real-time charge processing. You're not gaining much (if anything) by having it.

Sticking It Out for the Long Haul

Most of us wish we lived in an ideal world where we could realize instant results in our endeavors. Wouldn't it be great to drop those 30 extra pounds in just a week without dieting or exercise? Just as such a weight-loss goal is unreasonable, expecting instant results with your BBS is also unreasonable.

Every type of BBS, whether hobbyist, entrepreneurial, or business, takes a long time to get established, to take off and become accepted by your modem-using audience. It does not happen overnight, it doesn't happen in a few months, and it probably won't happen even in a year. It's important to be able to stick it out for the long haul.

For the hobbyist, sticking it out involves patience and commitment to your system. Since a hobbyist pays his or her own phone bill, bought the equipment, and so on, the cost of running a BBS that hasn't caught on yet is no more or less expensive than one that's extremely popular. Just be patient, do what you can to generate interest in your system, and keep at it.

For the businessperson, as I've said before, a BBS requires a commitment on the part of the company or organization behind

it. There are costs involved with keeping the system online, including the phone bill, the salary of the person responsible for the BBS, and so on. But most of the costs are up front, and once the money is spent, it's spent. It's important for all concerned parties to let the new company BBS run and ensure that it's kept up; in short, to live up to the commitment that was made when the system was put online. For most companies, the costs involved in doing so are minimal.

For the entrepreneur, sticking it out can get complicated. You started your BBS to make money, and if it hasn't caught on yet, it's not making any. Yet there are still bills to pay in a timely fashion each and every month. That's why it's important to understand up front, before you buy a single piece of equipment or order a single phone line, that running a BBS is a long-term proposition. Do not expect piles of money on your doorstep a short time after you open your doors, since it's not going to happen.

If you begin to run short of cash, it's time for drastic measures. Unless you can secure capital from other sources, you'll have to start reducing your system's financial overhead. Scale down your expansion plans, and if necessary, reduce your line count until things take hold again.

Even when you do start making money on a regular basis with the BBS, during the first couple of years you're likely to spend most of it expanding and enhancing your system. It's very unlikely you'll have much extra income to pay yourself, your partners, or long-term debt (if any). Be prepared for this to be the case.

The Pitfalls of BBS Operation

Most of the time, being a BBS sysop is an enjoyable, enriching experience. As with anything, however, there are times when you'll wonder why you bothered. These are the pitfalls of BBS operation, and I've compiled several of the more common types of pitfalls in this section.

Understanding the Virus Threat

In the mass media and even the general computer press, BBSs receive the bulk of the responsibility for starting and propagating *computer viruses*, computer programs that cause intentional damage to a computer by erasing or modifying data stored on it.

A virus attaches itself to another program, called a host. The host can be a normal, everyday application (like a word processor), or it can be part of your operating system. When the host program is run, the virus code is also run, which triggers the virus to cause the damage it was designed to cause, often reformatting disks, erasing files, and so forth. The damage can be immediate or time-delayed. The virus may also replicate when the host program is run, meaning the virus copies itself and attaches to other programs. Viruses spread when copies of an infected host program are passed to someone else for them to run on their own computer. As copies propagate from person to person, computer to computer, the infection spreads.

Closely related to viruses are *Trojan horses*. Similar to the legendary Trojan horse, these computer programs parade as legitimate and worthwhile software entities. Then, when you least expect it, they blow up, causing the same types of damage that viruses do (erasing files, reformatting disks, modifying programs, and so on). Unlike viruses, Trojan horses do not replicate themselves and attach to otherwise benign programs. Rather, they are passed from person to person as whole, purportedly useful programs.

Both viruses and Trojan horses are created by human beings, programmers who set out to cause havoc and damage intentionally.

By most impartial accounts, the virus threat is highly overrated. There's no question that viruses and Trojan horses do exist and have existed for some time. It's also true that every computer user runs a risk, no matter how slight, of infection. However, most of the people who are promoting the intensity of the virus problem are those who make and sell virus-scanning and removal utilities. Needless to say, these individuals and companies profit quite handsomely from selling antivirus solutions to scared computer users.

My recommendation is to exercise some level of caution, but don't lose any sleep over viruses. Here are some things to remember about them:

- **Isolate it** For viruses or Trojan horses to cause damage, you must actually *run* the infected program.
- **Sleeping dogs** If a user uploads a dangerous, infected file to your BBS, it will not and *cannot* cause your system any trouble provided you do not *run* the program. Merely having an infected program on your disk does not present a hazard until and unless you run the program.
- **Not in data files** Data files cannot carry virus infections. Viruses and Trojan horses are *computer programs* and are carried by computer programs. Data files, such as databases, spreadsheets, and so on, do not present virus risks because they are not programs and do not contain program code.
- **Not program bugs** Do not confuse program bugs or problems with viruses. Just because something acts funny on your computer, or your computer locks up, does not mean you have a virus infection. Many common types of program bugs can cause odd operation of your system, and even system crashes.
- **Screen uploads** If you allow uploads to your system, screen them with a virus-scanning utility before allowing other users to download the files. If you do not do this (newly uploaded files can be downloaded immediately), then your users who download may be at risk of virus infection (a user uploads an infected file, and another user downloads the file and runs it). Although your system may not be affected by the virus unless you run an infected program, you can still put your users at risk unless you use a virus scanner regularly.
- **Check inside compressed files** Most files on BBSs are stored in a compressed format, such as ZIP, ARC or StuffIt. These programs compress all types of data, including program code. Remember, viruses and Trojan horses are programs, and they too will be compressed by compression utilities. Make sure your virus scanner knows how to check *inside* of compressed files in the format(s) you use on your BBS. It must look inside the compressed files (not just at the compressed file) to recognize a virus that is present. (Check with the

virus-scanner vendor to determine whether the scanner looks inside compressed files.)

Hassling with Users

As I mentioned previously, from time to time you will encounter users who are seemingly bent on ruining your day. The busier your BBS is, the more of these characters you'll have to deal with.

For most of us, it's incredibly difficult to keep our cool when dealing with another person who is angry, who is being a pest, or is just plain an idiot. One of the most frustrating aspects of running a BBS is dealing with people like this, and you'll get a lot of practice over time as a sysop.

I don't have any advice on this matter other than to do your best to avoid overreacting. You will not be benefiting your system, your image, or your profitability by lowering yourself to the level of these types of users.

In many cases, angry or unreasonable users can be turned around into loyal customers who spread the word about your system to their friends. You should bear this in mind when figuring out how to respond to a user with an attitude problem. Remain as levelheaded as possible, try to separate the facts from the emotions, and respond only to facts. If there are no pertinent facts involved, then say so. For example, "I can see you're upset, but I'm afraid I don't understand why. Please let me know what has caused you to be this upset, and I'll certainly try to help."

In any case, try to be as pleasant as possible in return. Many users take a negative attitude with you because they want to get to you; don't let them. Keep with the facts, and don't get emotionally involved. If you get especially frustrated, then take a break from the BBS for a while.

Experiencing Fickle Users

Even if you have a loyal base of users, eventually you'll encounter users who become fickle. They'll stop calling your BBS for

one reason or another, indifferent about what you have to offer. In most cases, you don't have much to worry about.

Over the years you operate a BBS, you'll observe many seasonal changes in the calling patterns of your users. Historically, the fall and winter months are the most active months for BBSs of all types, but especially hobbyist and entrepreneurial systems. When spring rolls around and the weather heats up, your users will want to be outside enjoying themselves instead of stuck in their basement dialing BBSs like yours. That's not to say that during the spring and summer your system will be empty, but be prepared for usage to fall off during warmer weather periods.

Even without regard to seasonal changes, however, you will observe periods of time where call volume simply decreases for no apparent reason. Here again, you don't necessarily have anything to worry about.

Generally, if your call volume declines, stays low for more than two months, and is not tied to a seasonal change (warmer weather), then you should begin to look at what might have happened to cause the decline. Did you make a major system change? Are you having a rash of modem-related problems? Did you raise prices? Have you allowed your attitude to go downhill? Many things can cause a decline in system usage.

The point here is not to be too easily alarmed by the changing tides of system usage. It's more likely a temporary change, not a permanent one. Only if it is of prolonged duration and is not tied to weather changes should you begin seriously looking for possible reasons for the decline.

Getting in a Personal Rut

Just as your users can get fickle about your BBS, so might you in time. Running a BBS is a heavy burden, especially if you have a large, busy system. Even small systems require a fair amount of effort and time to prosper, but the larger the system, the more work and time that's involved. Although being a BBS sysop may be a lot of fun for months, even years, you will likely reach a time when you're in a bit of a rut, and you simply need a vacation from it.

For the hobbyist, this is fairly simple: Take a vacation and let the system run itself for a while. Feel free to explain to users in logon bulletins or news files that you need a break, and that the system will be on autopilot for a bit. Since your callers aren't paying for access to your system, you aren't obligated to provide service if you don't want to.

For the businessperson, this is one time where it's painfully obvious more than one person should know how to operate the BBS. If you need a break from the job, arrange for one if it's possible to do so. Some types of business BBSs can run on autopilot as easily as a hobby system. If you have the type of system that needs routine attention, make sure someone else is trained on how to babysit the BBS while you get your hard-earned break.

Taking a break is most difficult for the entrepreneur. Unless you're lucky enough to have a partner or associate who can look after the system, you may find yourself more than a little stuck. Entrepreneurial BBSs are a business, and businesses can't usually run by themselves. A BBS is no exception. Since users have paid for access to your system, you are somewhat obligated to make sure the system stays up and running, that questions get answered, that subscriptions get renewed.

For most entrepreneurial sysops, an extended vacation is unlikely. A day or two may be possible, but probably not the week or two you need to recover. It's difficult not to feel stuck, unable to get away. My advice is to try to take several regular breaks on a routine basis. Get away for a weekend day, or a even a weekday afternoon. Go see a movie, take a short trip, read a book (preferably one that does not deal with the topic of BBSs), do something to give yourself a break. You simply cannot spend every waking moment with your BBS, no matter how much it seems to beg you for attention.

If you get in a personal rut and stay there long enough, you should consider getting out of the BBS business for a while. An entrepreneur, however, may simply not have this option available. If you think you'll want to get back in later on, hand over the controls to a trusted friend, business associate, or partner, or even sell your BBS. (Large, successful BBS businesses do have a marketable value, like most businesses.)

Down Time

Your BBS operates on a computer. Like virtually any manufactured item, computers can fail in a variety of unpredictable and oftentimes unavoidable ways. When such a failure occurs within the computer running your BBS, you'll be forced to deal with the prospect of *down time*, time that your BBS is not available to its callers. If you operate an entrepreneurial system, this is also time your system won't be producing income for you. But no matter what type of BBS you run, it's in your best interest to rectify the situation as soon as possible.

The most common types of failures are those related to your disk system. They are mechanical devices, and they receive a particularly high level of usage in a BBS setting. It's not a matter of *if* they will fail—rather, it's a matter of *when*. This is one reason why it's important to keep regular, reliable backups of your entire BBS: file download areas, user databases, software used to run the BBS, message files, and so on. Many sysops back up every day, but you should at least do this weekly. This is by far the most important part of the solution when hard disks fail.

Other types of failures are less common, although they do happen from time to time. Modems, monitors, expansion cards, and even computers themselves can and do fail.

Whatever type of failure causes your down time, you need to approach the situation logically and calmly, no matter how much pressure you might be under to fix the cause immediately. If you have planned your BBS carefully as outlined in the early chapters of this book, then you should be prepared to handle down time when it arises with backup equipment or a budget that accommodates the purchase of replacement equipment.

Diligently work to solve the problem in as short a time as possible. If it's going to be awhile before the system can be back online fully, then if possible bring the system back up partially with less powerful hardware or with reduced line count. Make sure you post a bulletin or announcement online to alert users to the situation.

Once the problem is solved, don't be afraid to let your callers know what happened and why. Regular users will be curious

why the system was down, and all users will appreciate your honesty. If you run an entrepreneurial BBS, you may wish to credit your users for the time the system was down as a courtesy to them.

Getting Busted!

Depending on the type of BBS you run, you may cross paths with the law. In recent years, authorities have been getting more and more aggressive about shutting down systems engaged in questionable activities. These activities include adult BBSs (shut down on pornography charges), pirate BBSs (closed on copyright infringement or fraud charges), BBSs handling various types of fraudulent activities (credit-card numbers, satellite decoder and cable-box codes, long-distance access codes, and so on) and blatantly criminal activities (such as drug trafficking or prostitution).

It is not the purpose of this book to tell you what type of system to run or not to run. But if you are engaged in any questionable activities, or you feel that your activities expose you to some level of risk, you are wise to take reasonable precautions. Precautions may include the following:

- **Secure adequate liability insurance** Keep in mind that if you are in a high-risk business, major insurers are unlikely to issue you liability insurance.
- **Discuss your situation with a competent attorney** Only a good lawyer can tell you whether you have anything to worry about, and if so, how big a risk you're taking.
- **Form a corporation** Having your BBS owned by a corporation shields you against some types of risk. Keep in mind, however, that the corporate veil does not protect you personally against criminal activities.
- **Remove risky activities or items** If you feel something in particular crosses the line, remove it from your BBS.
- **Shut down your BBS** If you can't get any rest at night wondering whether the feds are going to come knocking at your door, maybe running a BBS isn't worth it. Consider shutting it down, or changing the entire focus and theme of your system.

Summary

After reading this chapter, you should have an understanding of the following:

- For your BBS to be effective, you must endeavor to be ethical in the operation of your system. You can earn your users' trust by exercising a few basic rules.
- Treating your users like customers is key to the success of the entrepreneurial sysop. This involves treating your users with respect, and providing them with quality service and help when they need it.
- No matter what type of BBS you run, avoiding ego involvement is critical to the success of your system. Clashes between your users and your ego are battles you can never win.
- Users call your BBS for reasons that might not always be obvious. Features alone are not the only factor motivating users to call your BBS. To keep your users calling, involve yourself in your BBS and avoid stagnation, shocking changes, and barriers.
- Users don't always keep calling for the reasons that made them call initially. Be attuned to these additional reasons. A sense of community is one reason people keep coming back to your BBS.
- Charging for access involves many factors, including selecting an appropriate charging method, pricing your product fairly, adjusting your prices when necessary, and making provisions to accept many different types of payment.
- An appropriate charging method is key to your success if you're an entrepreneur. The magazine model is the most effective, but BBS operators have tried the commercial online service model and the 900/976 model as well. The contribution method has proven to be ineffective. Regardless of the charging method, keeping pricing plans simple and offering free trial access help maximize your profitability.

- Accepting credit cards is important to any subscription-based BBS. It's not easy to get a merchant account that enables you to accept credit cards. Banks are the primary source of a merchant account, but there are alternatives.
- Operating a BBS is a long-term proposition. You must be prepared to stick it out for the long haul, rather than expecting immediate payoffs.
- Pitfalls to the operation of a BBS include viruses and Trojan horse files, user hassles, fickle users, your own personal motivation, and encounters with the law.

Worksheet 8: Operating Your BBS

How do you intend to operate your system in an ethical manner? Check off each suggestion when you fully understand how you will apply it to your own situation. Then use the ideas to form a policy statement you can use in the daily operation of your BBS.

- ❑ Walk your talk (fulfill promises)
- ❑ Keep money and personal information confidential
- ❑ Respect your users and treat them in a professional manner
- ❑ Don't humiliate users in public
- ❑ Don't pontificate on issues not specifically related to your BBS's theme
- ❑ Form a BBS policy

How will you handle comments—good and bad—from your users? Check off the ideas below that might apply to your situation. Then use these and your own ideas to form a policy or credo on how you will respond to your users.

- ❑ Respond with courtesy and respect
- ❑ Offer refunds on subscriptions for justifiable complaints
- ❑ Offer usage credits (free time) to users
- ❑ Print and file comments for future reference
- ❑ User response policy

Using any national BBS listing as a source for telephone numbers, call at least six systems that are similar in focus to yours. The annual *Boardwatch 100* contest results are a good source of such a BBS list. Write down one or two items that most impressed you about the BBS. These can be specific features or elements of the system, or an emotional response to something you saw or read while online with the system.

System called	Item(s) that impressed you the most
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

What can you do to help foster a sense of community among your users? Write down some ideas, gathered from the text or from ideas you've seen from calling other systems, that you'll use on your own system to help users form bonds with the system and with each other.

What can I do to foster community among users? _____

_____

_____

Research how much others charge for access to their system. Call two or three BBSs, either in your area or outside of it, and find out how much they charge for access.

System called	Pricing
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____

Which method of charging for access do you think is best for your situation? Be sure to select a charging method that your BBS software can support.

- ❑ I won't be charging for access
- ❑ I'll be charging with the magazine method (subscription-based)
- ❑ I'll charge with the commercial online service method (hourly charge)
- ❑ I'll charge with the modified commercial online service method (hourly, purchased in advance)
- ❑ I'll charge using a 900/976 number

Using the charging method you selected, and information extracted from your research of other BBSs, describe briefly what your system will cost and how it will be structured. Remember to keep your pricing structure as simple as possible.

Pricing structure _____

_____

_____

_____

What credit cards do you wish to accept on your BBS?

- ❑ No credit cards
- ❑ Visa
- ❑ MasterCard
- ❑ American Express
- ❑ Discover
- ❑ Diners Club
- ❑ Carte Blanche
- ❑ Other

How will you obtain merchant accounts? (Check all that apply.)

- ❑ My bank
- ❑ Third-party processor
- ❑ Card issuer directly

9

Finding Users for Your BBS

Once your BBS is online and operating, it's time to turn to maximizing the effectiveness and success of your system. Primarily, this is accomplished through the application and use of marketing techniques. The object of running a BBS is to get users online, and through marketing your BBS, you can do a better job of attracting those users.

Marketing starts with understanding—you need to know what marketing is and what it involves. You then select a generalized approach to your marketing, and begin to apply it.

People say free publicity is the best publicity, and I present some ideas on how to get free publicity for your system. You may also wish to pay for marketing, and I'll present some ways you can go about advertising your system.

Marketing doesn't stop there, however. Other ways to maximize the effectiveness of your BBS include follow-up, direct mail, and community involvement.

Understanding Marketing

Marketing is a vast topic. It refers to anything that promotes the selling of goods or services. In the case of your BBS, marketing involves getting people to call your system through promotional efforts and advertising. Marketing is a creative, somewhat inexact science. Billions of dollars are spent each and every year in the United States alone on marketing. Marketing is critical to the success of any business.

Many people confuse marketing with advertising. Advertising is only one of many different aspects of marketing, but potentially one of the most important. The marketing of your BBS may include not only advertising, but various types of publicity efforts, press releases, direct-mail campaigns, and more.

Because the subject of marketing is so vast and ever-changing, I highly recommend you study the subject in as much depth as your schedule allows. If you read up on marketing, and possibly take a marketing class at a local college or adult education center, you're bound to come up with many ideas of your own. You may be able to adapt marketing ideas that have worked for other types of businesses and use them to market your BBS. Keep your eyes open and be creative. One of the best series of marketing books I'm aware of is the *Guerrilla Marketing* series by Jay Conrad Levinson. Many parts of these books cannot apply to a BBS business, but you can use directly or adapt for your needs many other parts.

The most important part of marketing is to not be afraid to try new things. And no matter what you do in the way of marketing, make sure you track the effectiveness of your marketing so you can know what works and what doesn't. Refine and repeat the things that work; chalk up to experience the ones that don't, and try something different.

Promoting Your BBS—Two Approaches

When you begin to explore how to promote your BBS, one of the first decisions you are met with is what group or groups do you promote it in? For most BBSs, there are two separate target groups you can attempt to reach.

For the purposes of this section, let's assume you run a BBS for dog breeders. You of course want to promote your BBS so as many dog breeders as possible dial in and use your system.

Promoting to BBS Users

The first group you can reach is the community of BBS users at large. This is one of the most effective groups to target, since BBS users are already familiar with bulletin boards in the general sense, they know how to use a modem, and you won't have to educate them on the benefits of the technology—they already know all about that.

Promoting your BBS to this group involves focusing your marketing in areas where BBS users are most likely to see your efforts. I'll discuss specifics of marketing later in this chapter.

With our fictitious dog breeders' BBS, marketing to the BBS community has some drawbacks. Although BBS people use the technology, how many BBS users happen to be dog breeders? If you advertise to the BBS world in general, you'll be spending money to reach an audience that probably consists of a fraction of one percent of dog breeders. This is potentially a serious waste of money to reach such a large group when only a small portion of them will truly be interested in your system.

Promoting to Your Niche

You could promote your BBS within your niche group. They'll be familiar with your particular subject matter. In our fictitious example, you would promote your BBS to dog breeders. You might place advertising in dog breeders' newsletters, dog-oriented magazines, and the like.

On the surface, this seems like a much better approach, since you're reaching the specific people you want to call your BBS. However, you now have the same problem in reverse. How many dog breeders own a computer? Of them, what percentage have a modem? And of that group, how many know what a BBS is and how to use one?

Here again, you're getting down to a group that is potentially so small, you're wasting your marketing dollars again trying to reach them. You're reaching the right audience, but it's still a

scattergun approach, since only a small fraction of a percent of these people can use a BBS.

If you promote to this group, be prepared to have some explaining to do. Your promotional efforts may have some results, but you're likely to get responses from people who are curious but have no idea what a BBS is. Promotional efforts to the niche group must include some explanation about BBSs in general, and how one might get started in the online world. Unless you're prepared to educate the masses to some degree, you might consider skipping this approach.

Which Approach Is Best?

Unfortunately, there is not an ideal approach. In the example case, it's unlikely there exists some sort of newsletter for BBS-using dog breeders you could simply advertise in. You'll have to carefully analyze advertising and marketing opportunities and costs available for both approaches, and decide what your budget can manage.

Generally speaking, it's less expensive to market to BBS users in general than to your target group. This also frees you from having to explain the technology to people who have no idea what a BBS is, let alone why they might want to call one. However, marketing to your niche group may be necessary at some point to maximize your system's potential.

Getting Free Publicity

Most people would agree that the best publicity is free publicity. Getting free publicity isn't all that difficult; you just have to be willing to put forth the effort to make it happen. You can do all the work yourself for pocket change. You shouldn't need the expensive services of a professional unless you simply don't have time to put in the work yourself.

Before trying any of the free publicity ideas listed here, understand that not all your work will pay off. Press releases, one of the ideas I'll discuss, are not guaranteed to yield any press coverage at all. If you apply these ideas with persistence, however, you'll appreciate the results they can provide.

Posting on Other BBSs

One of the simplest ways to promote your BBS is to post messages on other BBSs in your area. This fairly common practice involves merely creating and posting a message in a public message area on other systems.

If you choose to do this, be aware that other BBS sysops may or may not be especially receptive to this idea. In fact, some sysops become rather hostile if people make such postings. Be sure to ask the sysop of the system whether you are allowed to post a BBS announcement on his or her system, and if so, where the best place is to make such a posting. In contrast, some BBSs actively encourage this sort of message traffic. I've seen many BBSs with special message areas set aside for this specific purpose. Again, use caution and discretion, and don't make any assumptions about whether it's okay.

When you go to create such postings, take the time in advance to prepare your message. Many BBSs allow you to upload a text file as the text of a message; whether you can use it directly or just type it in later, I recommend you create a text file with your announcement using a text editor or word processor. Be creative, but succinct. The most effective messages are those that are short and to the point. List the main focus of your BBS, along with some of its outstanding features. If you charge for access to your system, list the rates, and whether you allow free trial access. Try to limit your posting to one screenful of text or less.

Once you've created your announcement, post it on as many BBSs as you can. Don't hesitate to post it on out-of-state BBSs, since many BBS users willingly call long distance for good systems.

Again, it's important to check with the sysop of the BBS before you post your announcement. This takes more time and effort on your part, but it's time well spent to avoid upsetting fellow sysops.

Posting on Commercial Systems

Many commercial online services have areas set aside for people interested in bulletin board systems. CompuServe and Prodigy, two of the largest commercial online services, both have areas of their systems set aside for BBS enthusiasts.

If you have prepared an announcement to be posted on BBSs, don't neglect posting it on commercial online services on which you have accounts. This is potentially great national exposure for your system. Don't forget to include the area code of your BBS's telephone number in your announcement, since many of the callers these announcements produce will be outside your own area.

Make sure you follow the rules and policies that govern the commercial system you're posting to. CompuServe, for example, has several different message areas available in its BBS section, so pay attention to which message area you post your announcement to, or your posting is likely to be removed from the system or upset other participants.

BBS Listings

Many individuals and organizations maintain lists of BBSs. Most of these lists cover a particular subject matter or a particular geographical area. Making sure your BBS is added to as many lists as is appropriate is yet another way to get free publicity for your system.

The first step is finding lists. Many lists are distributed to BBSs, so spend some time calling other BBSs in your area (or even outside your area) to hunt down available lists. In most cases, you need to download the list before you can view or print it. Contact information for the person or organization that makes the list can usually be found at the top or bottom of the list. If

your system fits the subject of the list, contact the creator of the list and make sure your system gets added.

Boardwatch Magazine publishes a list of list keepers every month that is also an excellent resource for you. Use the list to locate BBS lists your system might fit. *Boardwatch* publishes the name of the person responsible for each list, along with a BBS telephone number for the system where you can download the list or obtain more information about it.

Some publications maintain printed BBS lists, too. *Computer Shopper* and the regional publication *Computer Currents*, available in some major U.S. cities, both have printed BBS listings. Look for these and for local computer publications, and find out how to get your system added to the list. Instructions are usually printed with the list.

Another idea is to create your own BBS list. If there's not one for your area, or not one that covers your BBS's subject matter, start your own list. Doing so is a lot of work, both doing the initial research and keeping the list up to date once it's started. If you choose to do this, it's critical to invest the time and effort to make sure you keep the list current. Check all the listings on a regular basis, and make corrections as needed. Of course, make sure your list gets distributed as widely as possible. Everywhere the list goes, your BBS name and phone number goes, too.

Press Releases

Press releases are a popular tool used by businesses of all types. Whenever you have something that is potentially newsworthy, prepare a press release and send it to print media that you feel would be interested in covering your story.

The key here is *newsworthiness*. Unless you feel your story has wide interest, don't bother preparing a press release. Your press release must be a news story. If it's nothing more than a self-serving advertisement, you're not likely to get anyone's attention with it.

To get some idea of what constitutes newsworthy information, spend some time reading computer trade journals such as *InfoWorld* and *PC Week*. A great deal of the information you find

in journals like these is about what companies are doing, and most of the stories started as a press release. With study, you should be able to sense which types of information are worth printing and which are not. Apply what you've learned to the BBS community.

Press releases should point out benefits to *people*—why something is of interest to a potential reader of the newspaper or magazine in question, not what is interesting to *you* or why something is neat to *you*. The cold truth is nobody cares much about what you like and find interesting and rewarding. They care about themselves, and you must create your press releases to speak to *them*, tell *them* what is interesting and newsworthy to *them*. Do the best you can to remove yourself from the story.

Press releases all follow a general, acceptable format. Many popular word processors are supplied with style sheets or templates for press releases. If your word processor comes with one, use it to create a sample press release. If not, consult a business style guide or marketing book for assistance in designing a proper press release.

Send your press releases to publications that make sense. For example, you might send press releases to modem-oriented publications, such as *Boardwatch Magazine*, *Online Access*, *Connect*, and *BBS Callers Digest*. These publications reach the modem-using public, and they are good candidates for printing a short blurb about your system if it sounds unique and interesting.

Send press releases to publications that cover your topical matter. For example, if your BBS covers musical entertainment, you might send releases to magazines such as *Billboard*, *Musician*, and so on. When you send releases to mainstream media, understand that your release will be read by editors (and readers) who may have no idea what a BBS is. Make sure you point out what might be obvious to you: for example, your system is accessible to anyone with a computer and telephone modem. Point out the basic parts of your system, such as electronic message networking between participants—something sysops and BBS users take for granted. People who don't know what a BBS is aren't likely to take the simple things for granted; make sure your release takes that into account.

You may need to write separate press releases for mainstream media and publications that deal with the online industry, since different items are likely to be of interest to these different audiences.

User Group Involvement

Another way to promote your BBS is to become involved in a local computer user group. As a BBS sysop, you're apt to know more about telecommunications than the average computer user. Once you're involved with a user group, share your knowledge.

You can give training sessions on modem use for the group, or teach people how to use a particular terminal software program. Of course, your session is a great opportunity to let people know you run a BBS. Have business cards or flyers handy so you can easily give out your system's name and telephone number when people ask about your BBS.

Write Articles

If you have writing talent and knowledge about telecommunications, put them to good use: write articles.

Small local computer newspapers or magazines, as well as user group newsletters, are almost always looking for good articles to grace their pages. Put a couple of articles together on modem technology, using bulletin boards, or how-to information for terminal programs, then submit the articles to these publications. If a publication accepts one of your articles, make sure that your byline identifies not only you, but your BBS name and telephone number as well.

Advertising Your BBS

Advertising is one of the more important aspects of marketing your BBS. It can also be one of the most expensive, so many

sysops find it hard to justify advertising. Hobbyists in particular aren't likely to do any advertising at all, whereas entrepreneurs need to seriously consider it and business sysops should use advertising where possible.

The opportunities for advertising your BBS are necessarily limited. The reasons are simple: Although the number of people using modems grows every day, it still represents a small overall percentage of the general public. Any advertising you do is apt to be unfocused and scattered, meaning that the majority of people who read the advertising won't be interested in your BBS for one reason or another (either they don't have a modem and don't know what a BBS is, or they aren't interested in your subject matter).

The challenge in advertising your BBS is to select appropriate advertising media that you can afford and that stands the best chance of reaching your desired audience.

Advertising a Business BBS

Business sysops are in a unique position in that their BBS is just one part of a bigger overall business. Advertising, although it can promote the BBS itself, generally piggybacks onto other advertising the firm does.

For example, Hayes Microcomputer Products, a major modem manufacturer, promotes its BBS in all its advertising. The name and telephone number of the system are part of its standard advertising footnote, along with its address, voice telephone numbers, and so on. As the number of people using modems grows, more end users will be looking for BBS telephone numbers in advertising. Even if you don't advertise your business BBS specifically, make sure that the system is given due attention in all other advertising the business does. Secure the necessary permissions to make this a part of your company's advertising, and make sure your advertising firm or marketing department is aware of what needs to be added.

Advertising a business BBS takes other forms as well. Microsoft puts the number for its BBS in the manuals for many of its software products, alongside other instructions for obtaining

technical assistance. Here again, as the number of modem users grows, more people will be looking specifically for a BBS telephone number in product materials. Make sure that the BBS name and telephone number are available in these materials, and take whatever steps are necessary within your organization to ensure that they are.

Advertising to BBS Users

One of the most cost-effective ways to advertise is to place ads in publications designed to reach the modem-using public, people who are likely familiar with BBSs and know how to use them. The downside to this avenue is that not everyone who uses a modem is going to be interested in your system's subject matter.

Publications that are good candidates for your advertising are *Boardwatch Magazine*, *Online Access*, *BBS Callers Digest*, and *Connect*. You may also find other types of publications can get results, too, such as *CompuServe Magazine* (distributed to all CompuServe members) and *Link-Up* (a niche publication dealing with communications). Keep your eyes open. New publications dealing with telecommunications continue to pop up as modem usage grows.

Some of these publications, such as *Boardwatch*, have classified advertising sections specifically devoted to BBSs. The ads are inexpensive and are usually quite effective.

If you can afford it, and if your system has some level of mass appeal, you might consider display advertising in one of these publications. Although considerably more expensive, display advertising has the potential to be much more effective than a classified ad. Figure 9-1 shows how such an ad might be designed. Pay particular attention to the fact that the content is concise; when composing your ad, keep it short and simple. Make designs as clean and uncluttered as possible.

The effectiveness of a display advertisement depends on many different factors. The size of the ad, the design of the ad, whether you use any color in the ad, and where the ad is physically placed in the publication all affect how well your display ad will work. Moreover, how many times your ad appears has a tremendous effect. The longer your ad appears in print, the more effective it

Shortwave Listeners!
You already listen to shortwave. You already call BBSs. Now combine the best of both!
The International Monitoring BBS
(303) 555-1928 (Modem)
We offer electronic discussion areas and real-time chat, allowing you to communicate with other shortwave enthusiasts like yourself. Plus we have a large library of files related to the monitoring hobby. Don't wait; use your modem and call us today! We have reasonable subscription rates and voice support. Credit cards accepted.
Questions?
Call us voice at (303) 555-1920

Figure 9-1
Example of a display ad for a BBS-specific publication

becomes. Do not expect good results by placing an ad one time, then pulling it. To be truly effective, plan on running your ad monthly for at least six months, and if possible, let it run indefinitely.

Buy an ad as large as you can realistically afford to run for six months. Secure the services of a professional to design the ad for you; just because you might have a good desktop publishing program at your disposal does not make you a good ad designer. (College art students are one good source of graphic-artist talent; place an ad to recruit a student in college publications or your local newspaper. They'll love the experience, and they'll work cheap.) If you can afford it, use color in your ad.

Advertising to Your Niche

Another audience you can advertise to is your particular niche, the group of people that would be most interested in your theme. Take some time to look for publications that are a good match for your system. If, for example, you have a system that deals with shortwave radio, you might want to advertise in *Monitoring Times* or *Popular Communications*, since these publications reach shortwave

radio listeners. Spend some time at a local newsstand or library researching what publications target your niche.

As I've mentioned before, the problem with advertising to your target group is that it's a scattergun approach. Most of the money you spend on such ads is wasted reaching people who don't even have a computer, let alone know what a BBS is or why they should call yours.

Over time, this type of advertising will become more effective, since the number of computer-using, modem-owning individuals is growing rapidly. If the advertising rates in appropriate publications are reasonable, you might want to test this type of advertising. In the preceding section, I outlined things to know about creating advertising. The only difference with this type of advertising is that you might want to be more basic and less technical in your ad, focusing on the fact that you're an online service reachable with a computer rather than on any confusing technical issues like baud rates. You may also wish to include a voice telephone number or mailing address where people can call or write to get information about your system. Figure 9-2 shows how a display ad might be designed for such a publication. Note the lack of jargon; keep the ad as simple as possible to avoid confusion.

Computer Modem Owners!

If you own a personal computer and a modem, put it to good use with your shortwave listening hobby! Call...

The International Monitoring BBS
(303) 555-1928 (Modem)

We offer electronic discussion areas and real-time chat, allowing you to communicate with other shortwave enthusiasts like yourself. Plus we have a large library of files related to the monitoring hobby. Don't wait; use your modem and call us today!

Questions?
Call us voice at (303) 555-1920

Figure 9-2
Example of a display ad for a publication targeted to your niche

If your BBS focuses on technical or computer issues—for example, if your system targets desktop publishers—you'll stand a much better chance of having this type of advertising be effective for you. A much greater percentage of people in technical or computer arenas have modems and know how to use them.

Advertising in Other Media

Another place you can advertise your BBS is in the general media, rather than in modem-related publications or in your specific niche area. Depending on the particular publication and the subject matter of your BBS, this may or may not be a good idea.

Here again, the scattergun nature of advertising this way makes it unlikely your advertising will be effective. You will in many cases be reaching people with modems who aren't interested in your subject matter, or people interested in your subject matter who don't have a computer or modem. Unfocused advertising of this type is probably the least effective advertising of all.

That said, you may wish to dabble with general media advertising if the prices are attractive and your BBS subject matter is broad enough. If, for example, you have a broad-appeal public system (no particular subject focus), this type of advertising may work for you.

I've spoken with sysops who have tried classified advertising in local newspapers and arts journals, with varying levels of success. Display advertising is most likely too expensive to seriously consider in a newspaper when you weigh it against the potential effectiveness of such an ad.

Another type of general media advertising you might want to consider is an ad in a computer publication, such as *PC Magazine*, *PC/Computing*, or *PC World*. These publications all have large circulations, and steep advertising rates to match. However, all of these publications (and many others) have some form of classified ads in the back that are specially priced and might be worth investigating. If you look through these ads, you'll notice advertising from other BBSs from time to time, mostly from large, established systems.

You may also wish to consider an ad in a local computer publication. Many cities have such publications, most of which are distributed free of charge in computer stores. Advertising rates vary widely, but compared to a national publication, they are quite reasonable.

Marketing Your BBS

In addition to advertising, you can market your BBS in many other ways.

One of the most important concepts to remember about marketing is that it is not always designed to attract new business. In fact, as your system gets more and more established, a great deal of your marketing effort will be directed toward your existing customers.

Tapping Existing Resources

Why should you bother marketing to your existing customers? As the saying goes, isn't that preaching to the converted? The answer is yes and no.

Some of the most effective marketing is targeted toward your existing customers. When someone does business with you, they've started a relationship with you. Once it's started, it's up to you, as the business owner, to make sure the relationship is nurtured and looked after. As with most any business, your BBS is a business that has opportunities for repeat trade with your existing customers. You cannot assume that someone who has used your BBS once will automatically be back for more.

This is especially true if your customer feels ignored. If yours is like most BBSs, you've got plenty of competition. Just because your BBS has more and better everything than your competitors doesn't mean your callers are going to renew their subscriptions or keep calling. You must care about and look after your customer relationships as though each and every one of them makes the

difference between the success and failure of your business—because (directly or indirectly) they do. The moment you treat even one of your callers as though he or she doesn't matter, you've started an attitude that can snowball into business failure if allowed to continue.

One of the ways you make customers feel good about doing business with you is to market to them. Make sure they know that you know they're out there. Make them special offers because you value their business, send them cards at Christmas, offer referral programs. Whatever you do, keep in touch with your users.

When I speak of marketing to your customer base, I'm not talking about merely doing things online. Remember, not all of your customers call regularly, and when they do, they're likely to be calling to use your system and not to get bombarded with messages about how happy you are they called. The majority of your marketing effort with a BBS business takes some form of direct mail, sending out printed marketing materials to your user base.

One of the biggest benefits of marketing to your users is to foster word-of-mouth advertising, some of the most effective advertising you can do. But you don't actually do it—your users do it for you. When you build excitement and interest in your system among your customers, they'll have a bond with your system and feel good about it. That gets them excited to tell others about it. Then those people call your system and become customers, and they'll tell their friends, and so on. Although this type of customer building takes time and patience, it's some of the most effective over the long term at constructing solid, reliable customer relationships that will pay off for years to come.

Finally, one of the biggest reasons to market to your users is that it's very likely your competition isn't. It costs money to market to your customers. Printing costs, your time in preparing materials and stuffing envelopes, and postage add up to some significant costs. Once your system is established and you have a user base of even a few dozen people, however, it's some of the most important money you can spend in the promotion of your BBS. If yours is the only system your customers call that makes this effort to reach them, it will make an impression about your system in

their mind that will make a difference when it comes time to renew their subscription.

Using Follow-up

Follow-up is one of the most important types of marketing to your existing users. It's a touch that has for many sysops made a real difference in the bottom line, and it's incredibly simple and inexpensive to do. Follow-up in this context refers to simply mailing a postcard or other materials to your new callers. When someone dials your system for the first time, collect his or her name and mailing address. Then send materials to that person in the mail.

Depending on the type of BBS you run and how you charge for access to your system, follow-up can be as simple as a postcard, or as complex as an entire packet of information. How involved follow-up gets is up to you—as long as you *do it* and do it with dedication. Even if you choose not to do any other type of marketing to your customers later (which would be a mistake), make absolutely certain you develop a follow-up plan and execute it.

If your callers subscribe online, then follow up with a simple postcard. Thank them for calling, point out a few important points about your system, and let them know again how much it costs to subscribe. Sign the postcard personally, and make sure your BBS number is on the postcard, just in case.

Some types of systems need authorization forms or other agreements signed and returned. If you have such a system, then send the paperwork with your follow-up package. If you'll be mailing other materials anyway, make sure you have a cover letter in the package, signed personally. As I mentioned for postcards, thank them for calling, point out some highlights about your system, and include your BBS number.

Even systems that don't need forms completed and returned should consider something more substantial than a postcard. Having your follow-up in a standard letter format sealed in an envelope is an extra added touch that a postcard can't offer. It also gives you an opportunity to send more information along

with the follow-up, such as rate sheets, information about user meetings you might have, some instructions on using system features, and so on.

If you send a mailing in a sealed envelope, put the user's login ID or name, as well as his or her password and your BBS's phone number, in the mailing.

Regardless of what type of follow-up you do, make sure it looks good. Word processing or desktop publishing software can't make a layout artist out of someone who isn't artistically inclined. If you don't feel competent to do this yourself, you may need to get the help of someone more skilled than yourself. It's better to buy some help than to send out materials that will create an unfavorable or unprofessional image.

Direct-Mail Marketing

Once you've collected your caller's name and address the first time he or she calls, and after you've sent out your follow-up materials, now is *not* the time to stop. As I mentioned previously, marketing to your existing users is some of the most valuable marketing you'll do. This takes the form of direct-mail marketing—simply, sending materials in the mail to your existing customers.

Direct-mail marketing can also be done to people who are not yet your customers. I believe that such marketing efforts are not realistic for a BBS, since it's exceptionally unlikely you'll be able to buy or rent mailing lists from mailing-list vendors that will be focused enough to make it cost-effective. As with general advertising, marketing of this sort is a scattergun approach. Direct-mail marketing costs more per person you reach than general advertising, making it simply a waste of money.

Direct-mail marketing to your existing customers, on the other hand, can be very effective and inexpensive if done right.

The object with direct mail to existing customers is to seal the bond between them and your business. One of the best ways to do that is to give them something. Giving can include information—keeping them informed about your system and what's happening.

It can include special offers for existing customers, such as subscription extensions at a reduced price if they respond quickly. Contests and giveaways are another terrific way to market to existing customers.

With your existing customers, don't feel obligated to send out elaborate materials. Postcards are inexpensive to produce and mail. If you add something of substance to your system, promote it (and your system) by mailing a postcard telling all about the new feature or function and inviting them to call and give it a try. Figure 9-3 shows an example of such a postcard. It doesn't have to be elaborate, in fact, the simpler the better.

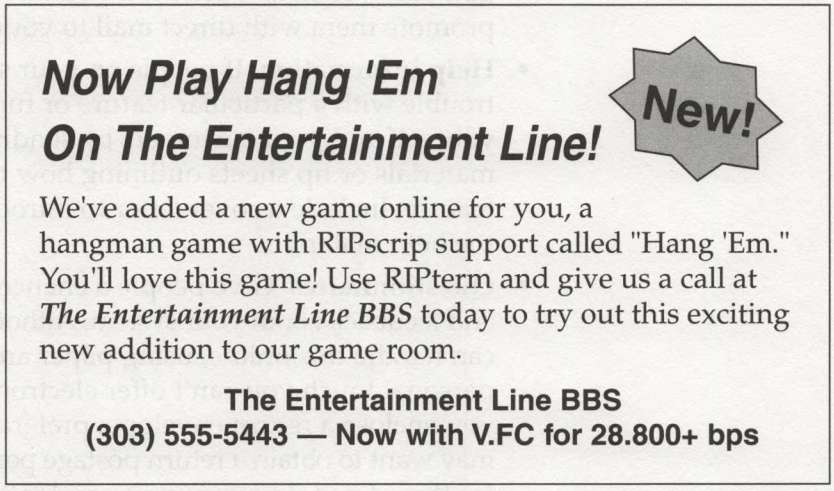
Now Play Hang 'Em
On The Entertainment Line!
New!
We've added a new game online for you, a hangman game with RIPscrip support called "Hang 'Em." You'll love this game! Use RIPterm and give us a call at *The Entertainment Line BBS* today to try out this exciting new addition to our game room.
The Entertainment Line BBS
(303) 555-5443 — Now with V.FC for 28.800+ bps

Figure 9-3
Example of a postcard for mailing to your BBS users

Here are some ideas for direct-mail marketing to your existing customers:

- **Contests** Give away subscription extensions, a software package, or a modem. If your BBS software supports it, set up a questionnaire for the contest and have your customers call your system to enter the contest.
- **New feature announcements** When you add something to your system, announce it with a postcard. If the new feature or function is involved enough, send a mailing with an instruction sheet on how to use the new feature.

- **Newsletters** Start a newsletter for your BBS. Send it out monthly if possible, or at least quarterly. In the newsletter, talk about everything that's happening on your system, how it's growing, that you've added more lines—whatever is going on that might be interesting to your customers. Make sure the newsletter has information in it that is interesting; it's better to skip a newsletter than to stuff one full of boring material.
- **Special offers** Have an existing-customer-only special offer. Offer subscription extensions at special rates, free usage holidays, or other types of offers that will increase your call volume or your cash flow.
- **User gatherings** Some types of BBSs can benefit from a user gathering, such as a picnic. If you have such get-togethers, promote them with direct mail to your customers.
- **Help information** If people on your system are having trouble with a particular feature or function online, help yourself and your customers by sending out instructional materials or tip sheets outlining how to use the particular feature. Include a cover letter to introduce why you've sent the help materials.
- **Questionnaires** Give people a chance to offer their opinions and feedback about your system. Although most BBS software can handle this online, using paper and regular mail is a personal touch you can't offer electronically. Make sure that you enclose a return envelope, preferably postage paid. (You may want to obtain a return postage permit from the post office for this.) Even if your customers don't return a completed questionnaire, the mailing has done its job of letting them know you care about their feedback (even if they don't want to give theirs).

Renewal Marketing

If you offer subscriptions to your system, don't wait until a customer comes knocking on the door of your BBS to get them to renew. Rather, approach your customers before they even realize that their subscription is about to expire. And don't miss renewal time as a prime marketing opportunity.

Starting at least a month (more if you can) before it's time for the customer to renew, mail out renewal information. It should include rate sheets, instructions on how to renew membership, and most important, marketing materials. These materials should outline major features on your system and any virtues that set your system apart from the competition. Treat the renewing customer like a new customer, and don't take for granted that he or she knows everything about your system (no one does). Even if your customers do know a lot about your BBS and what it offers, it doesn't hurt to remind them when they're considering spending money with you again.

As I mentioned before, don't stop at one mailing. If a customer doesn't renew, try again at least twice. And even if he or she still doesn't renew, don't give up—keep those names on your mailing list, and market to those customers again later. They're known BBS users, so don't forget about them.

INSIDER TIP. . . The Importance of Mailing Lists

You already know that in order to mail things to your customers, you have to have a list of their names and addresses. This is your mailing list, and it's one of the most valuable pieces of business information you can have. Your competitors would love to have a copy of your list; if it's worth gold to them, it's worth even more to you.

Work hard to keep your list current; the more out of date it gets, the less value it has, and the more money it costs you to mail materials out (since many of them will come back undeliverable). One of the best ways to do this is to offer a change-of-address function on your BBS. Use your BBS software's survey function (or something comparable) to allow your users to input their address changes. Once you have this information, make sure your mailing list immediately gets updated to match. Make it part of your routine to check for changes of address and get them entered into the database.

Your users won't always be reliable about entering their address changes. Often, you won't find out until the post office returns mail to you undeliverable. In the United States, you'll usually get a nice printed label on the returned item showing the customer's new mailing address. When you get this information, update your mailing list immediately, and remail the piece to the new address. (Unfortunately, you need to pay for the postage again.)

Finally, keep your mailing list backed up to disk or tape at all times. If you lose this list, you're losing one of the most valuable assets your business owns.

Getting Out in the Community

Some of the secret weapons I hear about from successful sysops fall into the category of community involvement. Many sysops tend to fall into a pattern where everything in their life and everything having to do with their BBS must happen electronically. Although it's comfortable sitting in that nice big chair staring at a computer screen, it's important to understand that not everything in your BBS life can take place online. I've already mentioned the importance of using regular mail and printed materials: Getting out and being visible in the community is another exercise that can have a big payoff for your business.

One way to be visible is to take part in community fairs. Most major cities have one or more fairs of this sort each year. If your system deals with a particular social group (Catholics, African-Americans, gays and lesbians, and so on), there may be fairs or other gatherings that happen within that social group that you can be a part of as well. Fairs usually have booths or tables you can rent inexpensively.

If you go this route, be prepared to explain what a BBS is and what's needed to use one. I recommend making the simple facts part of a banner or poster, which you'll need anyway to identify your booth. In addition to the name of the system, add a simple line as a footnote, such as, "All you need is a personal computer and a telephone modem to use our system!" I'll talk more about educating people unfamiliar with BBSs later on.

Another way to get among people is to host picnics or other types of gatherings for your users, as I've mentioned before. Most any type of BBS can benefit from these gatherings, but they'll be of interest mostly to systems with a social focus. These gatherings don't have to cost you any money; if you can't afford to sponsor a picnic, have a potluck. Or have small meetings at a local restaurant or bar to help get people together and to meet in person.

If you're not comfortable with a purely social gathering, host a technical session on how to use your system or particular features on it. This type of meeting is easy to plan and do. Often, your local library has a meeting room you can book, or if you live in

an apartment complex, you might have a rec room you can use for the meeting. Bring along a computer for first-hand demonstrations. You may need to rent an overhead projector and an LCD overhead display so that everyone at the meeting can see what you do. Have photocopied handouts available with a meeting outline or session plan.

However you get out in the community, don't hesitate to do it. Your customers will have a much stronger bond with you and your system if they can associate a real, live human being with the otherwise faceless BBS they dial into.

Referral Incentive Programs

If you work to have happy customers on your BBS, you'll have a stable of people who will be spreading the word about your system to others without you having to do much of anything to make it happen (other than to keep those users happy and interested). However, you can do some small things to help foster user referrals. Word-of-mouth referrals can and should be one of the primary ways people hear about any business.

Incentives can help boost your referral business significantly. There are several ways to offer incentives.

The first is to offer some sort of gift or reward to any current customer who refers someone else to your system. In most cases, these gifts and rewards are contigent upon the referred person actually subscribing to your system, since only then are you actually increasing your bottom line (and not just call traffic).

If the gift or reward is big enough, you may set a target number of referrals. For example, if a user refers ten people to your system who subscribe, then you could give that user a new modem or some other item of value. Make sure that you're not giving away the house with the rewards; ideally, you'll make more money on the referred business than you spend on the gift.

Even token items, however, can be good incentives. You could offer a book about communications or modems, which you can buy at a local bookstore for just a small cash outlay. Or if you

prefer, avoid having to lay out cash by simply giving free subscriptions or subscription upgrades to your users.

Keep in mind that the more valuable the gift or reward, the more people are going to work for it. If you can afford a big reward, give a big reward. Otherwise, a small gift with your incentive program is better than no incentive program at all.

Part of a successful incentive program is tracking. Make sure your existing customers understand that the new people who come to you must identify who referred them in order for your existing customer to be eligible. I suggest creating a set of rules for the program to avoid problems with people complaining their friends called your system but they didn't get the reward they were entitled to. Don't expect the new customer to volunteer referral information. However you collect new-user information (paperwork, online questionnaire, and so on), make sure you provide a space to enter the name of the person who told him or her about your system. Then make sure you follow through on the program by issuing the rewards you promised.

User Manuals

Another form of marketing to your existing users is a user manual. Many sysops have undertaken massive efforts to create complete user instruction manuals for their system. Done well, the user manual can be an effective marketing tool.

The availability of a user manual is one more way you can help new users feel welcome and comfortable on your system. They'll know you care enough to take the time to provide help getting around and using your system. Depending on your costs, you might consider giving away a user manual to new subscribers. Many sysops I know, however, sell it separately, giving it the potential of being a profit-making tool.

Once a user manual is in the hands of a customer, it stands ready not only to make existing customers feel good about your system, but to help get new business as well. User manuals have great pass-around value. Once a user is familiar with your system, he

or she can give the manual to a friend who is new to BBSs, and you've just earned yourself another customer.

If you decide to create a user manual, don't skimp. It's probably better to skip the idea than to create a marginal guide of questionable value. Make sure it speaks in a positive tone about your system to help evoke excitement in the reader. Finally, make sure it offers real value—it needs to help a user get around, understand your system, and figure out how to use available features. If it doesn't fulfill those goals, it's not of much value to you or your users.

Spend the money to have your user manual professionally produced. Don't exceed your budget, but don't skimp, either. Consider it an investment, and part of your overall marketing costs.

Educating the Masses

Several times in this chapter, I've spoken about various marketing moves you can make to reach people who might not know about BBSs. Advertising in the general mass media is one of many examples of marketing that will reach many people who just won't understand what you have to offer.

Although I don't recommend spending much time or money trying to educate and convert the general public into using bulletin boards, some such marketing may pay off for you if you put some thought and effort into it.

I've seen many sysops put together small brochures or pamphlets that they can give or mail to people who seem interested in their service but who don't have the vaguest idea what a BBS is. If you're hearing from such people, then you know your marketing (whatever form it takes) is working. If it's interesting people who don't know what a BBS is, imagine what it's doing for people who do.

If you decide to make informational materials about BBSs, keep in mind the audience of people who will be reading them. These days, most everyone knows what a computer is, but not everybody knows what a modem is or what it does. Make sure you

explain the obvious. Say that they need communications software (pointing out some of the more popular brands, such as Procomm or Crosstalk), a modem that hooks the computer to the telephone line, and of course a computer. Spend some time in the material pointing out some of the benefits of calling BBSs in general, and your BBS in particular. Try to create excitement and interest, which they'll have to have in order to be moved to action (such as learning what they need to know to call your BBS). If you're willing, provide a voice telephone number where they can get additional information.

Although it's a lot of work, putting materials together and helping neophyte users by phone can yield new business for you over the long term. It is not, however, the most cost-effective marketing you can do. By the time you factor in your time and effort, it's expensive compared to the business it will generate.

Local Computer Stores

One idea that many sysops have found useful is to create an attractive flyer for the BBS, and work with local computer stores to display the flyer or include it with modem sales.

Take the time to have an attractive flyer created and printed. If you don't have the talent to do it yourself, enlist appropriate help or pay to have it prepared for you. Then have it professionally printed—don't figure photocopies are good enough.

Once you have flyers ready, visit with the owner or manager of the local computer store. If he or she doesn't know what a BBS is, you may need to spend some time explaining the basics. Otherwise, tell the person a bit about your service, and ask the owner or manager to display your flyer or distribute it with sales of modems.

You might increase your chances of success by including a small BBS list in your flyer. This way, the flyer contains useful, valuable information instead of just an advertisement for your particular BBS. Of course, the flyer should have that, too, but a short listing of local bulletin boards increases its value—and the likelihood that the computer store will be willing distribute the flyer for you.

Summary

After reading this chapter, you should have an understanding of the following:

- Maximizing the effectiveness of your BBS involves the use of marketing. Many people confuse marketing with advertising, but marketing is a vast topic that includes anything that promotes the selling of goods or services.
- You can take two general approaches to marketing: promotions aimed at the BBS community, and promotions aimed at your particular subject matter or niche.
- Whichever route you take, you can get free publicity for your system, including announcements on other BBSs and commercial systems, BBS lists, and the use of press releases. You can also pay to advertise your system in print publications.
- One of the most powerful marketing tools is to tap existing resources—your current customers. Mail follow-up is one of the secrets to success with a BBS. You can also use direct-mail and renewal marketing to increase the effectiveness and profitability of your system. Getting involved in the community can yield benefits, as can referral incentive programs.
- Marketing takes time, effort, and often money. But it can pay handsome returns in the overall success of your BBS.

Worksheet 9: Finding Users for Your BBS

Which group will you market to primarily?

- ❑ BBS users in general
- ❑ Your subject niche
- ❑ A combination of both

Which avenues of free publicity do you intend to exploit? Note specifically which BBSs, commercial systems, and so on you'll use.

- ❑ Posting on BBSs

  _____

  _____

- ❑ Posting on commercial systems

  _____

  _____

- ❑ BBS lists

  _____

  _____

- ❑ Press releases

  _____

  _____

- ❑ Other

  _____

  _____

Do you intend to advertise your system? ❑ Yes ❑ No

If you intend to advertise, check the ways in which you intend to advertise your system:

Business BBSs

- ❑ Add BBS number to advertising
- ❑ Put BBS info in product manuals

All BBSs

- ❑ Ads in BBS publications

  _____

  _____

- ❑ Ads in niche publications

  _____

  _____

- ❑ Ads in computer publications

  _____

  _____

- ❑ Ads in local newspapers/magazines

  _____

  _____

- ❑ Other

  _____

  _____

If you intend to advertise, will you use

- ❑ A classified ad
- ❑ A display ad

If you intend to advertise, how long will your initial advertising campaign be?

_____ Months

What other types of marketing do you intend to do?

- ❑ Tapping existing resources (marketing to existing users)
- ❑ Using user follow-up (new-user materials)
- ❑ Direct-mail marketing
  - ❑ Contests
  - ❑ New feature announcements
  - ❑ Newsletters
  - ❑ Special offers
  - ❑ User gatherings
  - ❑ Help information
  - ❑ Questionnaires
  - ❑ Others _____
- ❑ Renewal marketing

- ❑ Getting out in the community
  - ❑ Community fairs
  - ❑ User picnics or other gatherings
  - ❑ Technical sessions
- ❑ Referral incentive programs
- ❑ User manuals
- ❑ Educating the masses

10 The Business of Running Your BBS

If you will be starting and running a business in conjunction with the operation of your BBS (as the entrepreneurial sysop will), then there's a lot you need to learn and know about the operation of a business if doing so is new to you. This chapter is devoted to familiarizing you with the basics of being in business and the issues that come with it.

First and foremost is developing a business mind-set. This is especially important if you've not operated a business before.

Also important is a complete understanding of operating costs, and the differences between real costs and intangible ones. You should also develop a business plan, whether formal or informal, to guide you on your path to success. Every business has a legal structure, so I help you understand the differences between proprietorships, partnerships, and corporations.

You have some obligations when you run a business, including licensing, taxes, accounting needs, and insurance. You should also understand the risks involved with running any business.

Developing a Business Mind-Set

As with many things in life, running a business and whether you succeed at it depends entirely on what you put into it. If you don't put much effort into your business, you're not likely to be very successful with it. On the other hand, people who invest time and energy into their new business are much more likely to succeed.

Being successful at your BBS business involves more than time and money. It requires a mind-set—an attitude that will help govern the decisions you make and how you make them. A business mind-set also includes the motivation to succeed and the willingness to ensure that you do.

For some people, the business mind-set comes naturally. It's an entrepreneurial spirit, an energy that drives people toward the goals they set for themselves. For others, it takes more effort. Here are some suggestions on developing a business mind-set.

- **Realize you are running a business** This is probably the most important aspect of the business mind-set. When you start your BBS business, you've stopped being just you. You're now at the helm of a new entity. It's up to you to guide this new entity from its birth into adulthood. This takes a sense of responsibility to manage well. Treat your business with importance and respect.
- **Separate your personal life from business** If possible, rent a small office and base your business and your BBS there, instead of your home. You'll be better able to separate business and personal matters in your mind when they're physically separated as well.
- **Schedule your business time** Instead of allowing yourself to approach your business willy nilly, schedule times when you'll be focused on it, and stick to your schedule. Set a schedule even if your BBS business is part-time. To avoid getting burned out on your business or allowing your business to ruin your personal life, make sure the schedule is realistic. Running a BBS can suck up every minute of your life if you don't make time for it, and time for other things, too.
- **Separate your finances** If you're a sole proprietorship (in business alone with no corporate structure), don't run your personal and business finances together. You'll be better able to develop a business mind-set if the business has its own income and its own expenses, handled separately from your personal income and expenses.
- **Set realistic goals** It's difficult to plot a course somewhere unless you know where you're headed. If you don't create a

full-blown business plan, at least make a list of goals you have for your BBS business. Don't think about money alone; think in terms of user base growth, line-count growth, and other factors. Once you have goals in place, fill in the space between those goals and where you are now. How do you intend to get there? Revise your goals regularly. As you achieve one set of goals, make new ones. If you keep moving along, reaching a little further each time, you'll eventually look back and wonder how you made it so far.

- **Think big** No matter how big or small your new business is, think big and act big. Don't lie to yourself or others; if it's just yourself, don't say you have 20 employees if someone asks how many there are. But in your mind, think about where you want yourself, your BBS, and your business to be in two years, five years, ten years—presumably, you want growth and greater things. Stay focused on those dreams, instead of belittling yourself or getting mired down in how you alone are going to make it happen.
- **Be realistic** While thinking big, maintain a realistic point of view. If you can't afford that full-page ad you want, then make it a goal for the future and go with what you can afford for now. We can't all be the president of a multinational corporation. Just keep shooting high while keeping your feet firmly planted on the ground and in touch with reality.
- **Think outside yourself** When you think of your business, separate yourself from it. Look at it as though somebody else owns it. How does that company look to you? What would that company do differently if you were in charge? How would the employees of that company act if you talked to them? Don't just think of it as you; think of it as a growing, vibrant company. This also allows you to keep yourself in check. Periodically assess how you're doing as a company the way other people look at you. It's easy to get caught up in the day-to-day matters and lose track of how others see you and your business.
- **Project a professional image** When you talk on the phone, speak like the intelligent businessperson you are. If you deal with anyone in person in conjunction with your BBS business,

dress nicely. Make sure your marketing materials look good, as good as you can afford. Make sure details are attended to, such as correct spelling, both in your marketing materials and on your BBS. When you think professionally and act professionally, you're helping to develop that business mind-set.

Understanding Your Operating Costs

In every business, there are two sides of the spreadsheet: income and expenses. Income is relatively easy to track. Most of the time that your business receives money from someone, it's income. Expenses, on the other hand—your operating costs—aren't quite so cut and dried. Costs come in two forms, real and intangible. The fact that only one of them normally shows up on your accounting reports makes it more tricky to know when you're succeeding with your business.

Real costs show up neatly and conveniently in your recordkeeping. Anytime your business writes a check, it's an expense in some form, and one of your real costs. They involve anything you can easily account for, such as buying equipment, paying your telephone bill, or getting a software upgrade.

Intangible costs are those things you can't readily account for. They don't usually show up on any accounting reports or in your check register. Yet these costs are legitimate, and they must be taken into account whenever you're trying to figure out whether you're on the right track with your business or with a marketing campaign.

INSIDER TIP. . . Intangible Costs

If you're like most small-business owners, you don't draw a salary from your company. Even if you've set up a corporation, there may not be enough profit yet to put yourself on the payroll. In either case, or even if you are drawing a salary, chances are excellent you put in a lot of time working for your business without having that time accounted for and made part of your operating costs. Yet this time is valuable regardless of whether money changes hands as a result.

Intangible costs consist mostly of your time. Anything else your business does most likely involves things you can touch, feel, quantify—and write a check for. Your time, however, is abstract, but it's a critically important part of assessing the relative success of your business. You need to take intangible costs into account both for the business as a whole and for particular projects.

For example, suppose you did a direct-mail promotion to all of your users. In terms of actual materials and postage (all real costs that are accounted for), it cost you $500 to do the mailing. Since this particular promotion involved a special price on BBS renewals, you were able to track exactly how much money the promotion brought in, which was $700. Although it's not a tremendous profit, you feel fairly pleased that you got $200 out of the deal you wouldn't otherwise have had. Even those users who didn't participate were touched by your business, and that helps build goodwill and solid customer relationships, which you can't really measure the value of with regard to this specific promotion.

However, let's stop to factor intangible costs. It took you three hours to create the materials you used in the promotion, using your desktop publishing program. You spent an hour total driving to and from the copy shop where the materials were duplicated. You and your spouse each spent three hours folding the materials and stuffing envelopes (a total of six hours). You spent another hour putting stamps on the envelopes, and another hour running them to the main post office. Total time investment: 12 hours. If you paid yourself minimum wage, that would be about $60 worth of your time. But your time is worth more than that; let's assume you'd pay yourself $15 an hour. That's $180 worth of your time invested in that promotion. Yet it brought in only $200. Suddenly the real payoff of that promotion was only $20—hardly enough money to make it worth doing.

Thankfully, the picture is not usually that grim. The point is that there is a lot more to the costs of doing business than the measurable materials that went into it. Make sure you take into account your own time when measuring the success of your business, or any project the business does.

Planning Your Business

Planning your business is extremely important to your success. Whether you plan formally or informally isn't as important as taking the time to plan—to chart a course for your business. Imagine getting into your car and driving without having any-place to go. When you reach an intersection, which way do you turn? Do you turn at all? What basis do you use to make the decision? It'd be a pretty pointless, pretty aimless little journey, wouldn't it? Failing to plan your business is much the same way.

When you reach a crossroads and it's time to make a decision, you can certainly make a decision. But on what basis do you make that decision? When you plan your business, you plot a route that you'll take to get from point A to point B. Along the way, when it comes time to make decisions, you have a framework on which you can base those decisions, making sure you don't sidetrack yourself—and your business—by making the wrong ones.

Informal Planning

Informal business planning is much better than none at all. Depending on your circumstances, informal planning can be as effective and useful as a more formalized plan.

Making an informal business plan is ideal for a one-person business you finance yourself. The purpose of the plan becomes strictly a course for you to follow from where you and your business are now, to where you ultimately want to be. An *informal plan* means that the plan doesn't need to have a defined structure; it doesn't even have to be typewritten or laser-printed if you don't want to take the time to prepare it that way.

Whatever you do, however, write down in whatever form you feel is best where you want to take your business, and in what time frame. Follow these steps to help you create your informal plan:

- **Purpose** Start with a single sentence that describes the purpose of your business. Like the theme of your BBS, this sentence will help you stay focused and directed if you begin to drift (as most of us tend to do, being human). Over time, make sure that your business activities and decisions are consistent with your stated purpose.
- **Goal** Set a goal, and be specific. This is what I mean by charting a course. When you chart that course, you start with where you are now and end with where you want to be. You can fill in details later; for now, select a goal you feel is reasonable, and write it down in as much detail as possible. For example, you might state that within two years you want to have 1,000

paid subscribers to your BBS, and you want to have 32 lines in service. You can also state your goal in the form of an income target, but try to stay focused on the mechanical goals first (line count, user count, and so on) then derive an income target from that. For example, if you have a goal of 1,000 paid subscribers, and your average annual subscription rate is $60, then that's a monetary goal of $60,000 per year (gross income).

- **Marketing** State the processes by which you intend to reach your goal. This primarily means your marketing efforts, and Chapter 9 should have helped with specifics for this part of your plan. You might wish to write down how much money you intend to spend on marketing.
- **Investments** Outline your investments. Investments are not just financial; they also include your time. Outline what, how, and in what quantity you plan to invest to reach your goals. Include money you plan to spend, as well as how much of your time you plan to devote to making it all happen.

Once the plan is written down, revisit it regularly. (For this reason, I recommend keeping the plan written, using a word processor.) Make revisions to your goals and all other parts of your plan as circumstances change.

Formal Planning

Formal planning involves the creation of a traditional written business plan. This type of business plan is best when people other than yourself are involved in your business, whenever you need to attract investors, or if you need to approach a bank for any reason (for example, to get a credit line or a credit-card merchant account).

Note: A properly prepared, complete, formal business plan takes anywhere from 50 to 100 hours to prepare. It follows a generally accepted format and layout and involves a considerable amount of study, research, analysis, documentation, and review. For these and other reasons, I highly recommend that you visit your local library or bookstore. Dozens of good books exist on the subject of writing business plans, and I strongly encourage you to use one

of these books to guide you in your efforts. One I have found particularly helpful is *Your First Business Plan*, by Joseph Covello and Brian Hazelgren.

A formal business plan contains the following elements:

- **Cover sheet** This identifies your business and the principal(s) behind the business.
- **Table of contents** This lists the contents of the business plan, including page-number references.
- **Executive summary** This summary distills the entire business plan into just a few paragraphs, and it is intended to grab your reading audience. It can often make or break a business plan. It identifies your company's mission, its background, its advantages over the competition, projections, needs, and investor-payback timetable, and it outlines the capital the business needs, as applicable to your situation.
- **Present situation** This section details your current operating condition, including information about market conditions, pricing, a profile of your customer base, your management team, and current financial resources.
- **Objectives** This section is a general statement of where you intend to take your company. This is more than money; it involves discussion of market share, targets (in the case of a BBS, things such as desired number of subscribers, line counts, and so on), and how you intend to reach the objectives—what's necessary to get you from here to there.
- **Management** This section outlines the people behind your organization. It not only identifies people by name, but also outlines their qualifications and relative strengths to meet the objectives you've set out for the company. Backgrounds, education, experience, and achievements of each management person are important here. The object is to let outsiders know that the people responsible for your company are qualified and capable.
- **Product description** This section is a complete description of the product you're selling (with a BBS, your product is the services you provide). It needs to identify and spell out in detail what is offered, why it is good, why it is better than your competition, why it's unique, and so on.

- **Market analysis** This section details the conditions of the market you operate in. It includes a description of the strengths and weaknesses of your operation. It should also include a profile of your typical customer. This section ends by identifying your competition, and how you compare to it issue by issue, item by item.
- **Marketing strategy** This section outlines your marketing plan. That is not only your overall strategy, but also specific plans, such as what advertising you'll do and where. It should also state who is responsible for the marketing effort, as well as how much money is being spent on the marketing effort.
- **Selling tactics** This section outlines procedures and mechanisms that pertain specifically to selling. This includes how you'll sell, how you'll handle unhappy customers, what cooperative arrangements you might have with other companies (cross selling), and so on.
- **Financial projections** This section is filled with traditional financial data, such as statements of assets and liabilities. It also includes information or spreadsheets covering profit and loss, operational expenses, and cash flow.

Your business plan doesn't necessarily have to be as formal as outlined here—it depends on your needs and intended purpose. The accuracy or completeness of the plan can also be relaxed if you are not creating it to attract investors or credit. But if you are, I recommend you be as formal and accurate as possible, especially with financial data.

Once the business plan is created, you should endeavor to update it on a regular basis—every six months to a year at the minimum.

Structuring Your Business

A business structure refers to how the law looks at your business. When you open a business, one of your first decisions must be what type of business structure you feel is best for your needs.

The common types are sole proprietorship, partnership, and corporation. Each type of structure is designed for different circumstances. Table 10-1 shows a summary of the various structures, along with how each is owned, managed, and who has liability for the business.

Table 10-1
Business Structures and Ownership, Management, and Liability for Each

Legal Entity	Ownership	Management	Liability
Sole Proprietorship	You	You	You
Limited Partnership	You and partners	Decided by terms of partnership	Decided by terms of partnership
General Partnership	You and partners	Shared equally or agreed to	Shared equally
Corporation	You and/or other shareholders	Officers of corporation (which may include you)	Officers (criminal liability); corporation itself (civil liability)

Please note that you may need to seek the advice or assistance of a competent attorney to select the business structure that is best for you, or to file any paperwork that may be necessary in your jurisdiction. Laws that apply to business structures vary from state to state. Your state's department of revenue or secretary of state should be able to supply you with necessary forms and information about business structures, applicable licensing requirements, and so on.

Sole Proprietorship

A *sole proprietorship* is the simplest of all business structures. A sole proprietorship, as the name suggests, means that there is just you involved—you're the sole proprietor.

In many states, you don't have to do anything to legally transact business under your own name as a sole proprietorship. Most states require that if you transact business under a name other than your own, you must register that name with the state (usually with the department of revenue or secretary of state). Often, a fee is involved with this registration. Its purpose is to make the state aware of your business activities and for your

business name to become part of the public record so people can determine the owner of your company should the need arise.

Sole-proprietorship income is usually handled on your personal income tax form, using Schedule C to outline your business income and expenses. Consult an attorney or tax specialist for further information.

One of the negative aspects of a sole proprietorship is liability. Since legally you and your business are one and the same, should you be successfully sued by someone making a claim about your business, your personal assets could be used to settle that claim. In a sole proprietorship, all profits, losses, and liability are shared between you and your business.

Partnership

A *partnership*, as the name suggests, is a legal agreement between two or more individuals for the purposes of starting and operating a business. There are two types of partnerships: limited and general. Limited partnerships spell out how the business is split between the various partners, including profits, losses, and liability. General partnerships assume all parties involved are equal partners for all matters.

INSIDER TIP. . . The Appeal of Sole Proprietorship

In most cases, a sole proprietorship is the best business structure to use when starting an entrepreneurial BBS. Among existing entrepreneurial systems, it is by far the most popular business structure.

Since a BBS rarely needs more than one person to operate it, there's little reason to select a different structure if you have the financial means to bankroll the business yourself. If you don't, however, you may need others to help pay your start-up costs and this is where partnerships and corporations become attractive for the BBS entrepreneur.

Another reason to go with a sole proprietorship structure is control—you have it all. Any decisions that relate to the business are made by you and are not influenced by others in any way. Many people prefer the freedom to sink or swim on their own, and only a sole proprietorship offers that freedom without the additional people and/or legal paperwork that partnerships and corporations require.

Generally, partnerships can be tricky to set up and operate, since you and your partners must agree on matters of both day-to-day operation and long-term stategic planning. Partnerships are best when you know you will be comfortable working with the other person or people who will be your partners, and you are certain that you will be able to run the business effectively. Make sure all partners are prepared to work out any conflicts. Preferably, have contractual agreements on how arguments are to be settled and for handling issues such as one partner wanting to get out of the business.

Although it's possible to set up and run a sole proprietorship or corporation without the assistance of a lawyer, I highly recommend you seek professional counsel if you go to set up a partnership. Only a competent attorney can advise you on the plethora of issues involved.

Corporation

Probably the most popular type of business structure is the *corporation*. In essence, the law views a corporation as an entity unto itself. A sole proprietorship is the same entity as its owner; a partnership is composed of its partners. But a corporation becomes a legal entity itself, providing many advantages in the process.

When a corporation is formed, it is owned by shareholders, one or more people who each own a share of the company. The company is run by corporate officers (a president, secretary, treasurer, and so on). The officers are elected by a board of directors. The board is elected by the corporation's shareholders. The officers run the company; the board makes sure that the company is operated by those officers in the best interest of the shareholders; the shareholders make sure the board does its job. In some states, you as a single person can be the officers, the board, and the sole shareholder. In other states, you may need other individuals involved in one or more of these positions.

Because the corporation is a legal entity, the corporate structure can offer you some level of protection. For example, if the corporation does something wrong, it can be sued in court for liability

without necessarily affecting you personally. In many cases, the corporate structure serves as a buffer between you and some types of negative situations you can find yourself in. Forming a corporation is not a panacea, however. You can still be held personally liable as an officer of the corporation for certain activities, including the commission of crimes in conjunction with the corporation's business activities.

Corporations are formed through a filing procedure with your state. Your state's department of revenue or secretary of state's office can provide more information on what is required.

You should consult a competent attorney for more information on forming a corporation, and regarding issues such as personal liability. Although you can form a corporation yourself in most states, I recommend that you pay a lawyer to handle it so that you can feel confident that the job has been done correctly and to your maximum benefit.

Understanding Business Obligations

When you operate a business, you need to be aware of several things. The operation of a business introduces you to new legal requirements, as well as issues you might not have thought of. If you fail to fully explore all of these issues, you may find yourself in a difficult situation later on, such as ending up in court, being fined by the government, or being liable for taxes you didn't know you owed.

This section is a primer on some of the more common things you must consider when running a business. It is not intended to be a complete set of reminders for you. Starting and operating a business can be a complicated matter. If you are concerned about a legal issue, find yourself confused, or simply want to ensure you haven't missed anything, I highly encourage you to part with some money and pay a lawyer to help you. Attorneys are expensive, but the cost of hiring one up front can pale in comparison to the costs of defending you in court later on when you find you missed a small but important detail.

You should also take the time to investigate what types of small-business services are offered by your state. Many states now have small-business assistance offices where you can get information on and basic assistance with the more important issues you'll face. You should also spend some time at your local library or bookstore, which are well equipped with dozens of books on starting a business.

Licensing Requirements

Many states and local governments require you to have licenses in order to operate a business. You can find out what is required by calling your city, county, and state governments. Contact either the licensing division or the department of revenue (whichever applies).

A business license is often the minimum requirement. It provides a facility for the government to know that a business is in operation under a particular name. In case of legal action, it knows the names and addresses of the individuals behind the company. It also allows government authorities to check in on you and determine whether your business operation has had income that is taxable. Sometimes this type of requirement isn't actually a license, but a business-name registration. In any case, some form of this license or registration is usually required.

Sometimes a license is required for your business to operate in the building it's located in. The purpose of this type of license is generally to ensure that businesses operate in areas that are zoned for business uses. This also allows authorities to disallow the operation of a business from your home in areas where this type of activity is prohibited.

Finally, you may need sales-tax licenses for your city, county, and state, and possibly for special districts (such as transportation districts). Even in cases where you don't sell tangible products, you may still need to have a sales-tax license and be able to prove that your business does not generate taxable income.

Tax Liabilities

When you operate a business, the general goal is to have a profit. To have a profit, you must have income. In the United States, you are obligated to pay taxes on your business income to the city, county, state, and/or federal governments. Should you fail to report business income, however big or small, you could find yourself explaining the matter to a judge, or at the minimum paying steep fines and back taxes for your oversight.

Income taxes aren't the only type of tax you may be obligated to pay; sales or use taxes may also be an issue. Traditionally, sales tax has been levied on goods sold by a business. In an effort to increase their tax base, many local and state governments are increasingly requiring the payment of sales tax on services, too—transactions where no tangible goods have changed hands. It is this type of service that a BBS provides. Don't take for granted that you don't owe sales tax; you very well might.

Sales taxes are normally handled via a sales-tax license, as I mentioned previously. Once you have such a license, you charge sales tax where applicable and report your income and taxes due on a regular basis (usually monthly or quarterly) to the authorities that collect sales taxes. You may need sales tax licenses and need to collect sales tax for your city, county, and state, as well as for special districts that may apply. Often your city or state government department of revenue can assist you as to whether you must collect sales tax, and if so, which particular sales taxes you must collect.

Regular income taxes, paid on your profits after expenses (if any), are reported much like your personal income taxes, except that sometimes you need to pay throughout the year (quarterly, in most instances). How you file income tax depends on your business structure.

Income from sole proprietorships, for example, is claimed for U.S. federal income taxes on Schedule C. You outline your income, expenses, and net profit (or loss) using this form, and file it along with your personal income tax form. A corporation, on the other hand, must file a separate set of income-tax forms.

You should consult a tax specialist or attorney for information on income-tax requirements for your business. The Internal Revenue Service can help with federal requirements, and your state department of revenue can help with your state's requirements.

Accounting

As you probably gathered in the discussion of tax liabilities, you need to keep excellent records of your business's cash flow. If you're accustomed to keeping rough records of your personal finances (as many people are), you need to forget your old bad habits when it comes to your business.

Accounting begins with tracking your expenses. Remember that your net profit (or loss) is your income minus your expenses. If you don't track expenses well, you could end up with a higher tax liability than you deserve.

Anything your business spends money on, from your computer hardware and software to a box of paper clips, must be properly tracked and accounted for. Expenses, for example, must be categorized for the purposes of tax reporting. To the IRS, your new computer and that box of paper clips are two different types of expenses. Although accounting is not difficult to do on your own in most cases, you should consider securing the services of a good accountant to assist you.

Expenses come in three general forms: general operating expenses, inventory costs (cost of goods sold), and fixed assets. General operating expenses are things like your phone bill, office supplies, advertising, and so forth. They mostly include expenses for exhaustible items—things you use once or use up as a supply (paper clips). Inventory costs are special, in that your customers in essence reimburse you for the cost of the materials that went into making your product when they buy it from you. (Since a BBS doesn't in most cases involve selling goods, you don't need to worry about this.) Fixed assets are business costs that you do not exhaust—things that are designed to be useful for a while. These things include your computer, an office chair, a modem, and so on.

With fixed assets, you have another concern: *depreciation*. Your fixed assets lose their value over time, theoretically at a set pace. For tax purposes, depreciation means that you must claim the item on your taxes as an expense over a period of time, for the duration of its useful life. Different items have different depreciation schedules, so different items must be claimed differently on your taxes.

In addition to expenses in various forms, you also have income. You must claim all of your business income on your income tax, and therefore you must track the income carefully. Income is much easier to account for than expenses, since you don't have to worry much about categorizing it.

You should be prepared to itemize every piece of your income, and every expense your business has. This can be a big job, but it's critically important. Should a government authority audit you (which can happen on both sales taxes and income taxes), you'll have to substantiate each and every line item you reported. You have to supply evidence of every income and expense item your business has. To do this, you must have accounted carefully for all of these items. That's why accounting is criticially important.

Accounting is important for another reason, too: you. As a business owner, you should know at all times where your business stands financially. Are you operating at a profit? At a loss? What is your income trend? Is income going up or down, and how quickly is it moving? All of these types of questions are ones you as a business owner should have. To manage your business effectively, you also need to have answers for these questions.

Since as an owner of a BBS business you are familiar with computers, you should use them to your benefit. Several good accounting programs are available; if your needs are simple, try Intuit's Quicken. However you do it and whatever you use, track income and expenses with your computer, keep good paper records as well, and you should be able to answer you own business financial questions—as well as the government's questions, should the need arise.

Insurance Needs

As the saying goes, "stuff happens." Although we all know it can happen, we never quite learn to expect the unexpected. That's where insurance enters the picture. Insurance is designed to cover you against catastrophic incidents that otherwise could do you severe financial harm. Most people carry automobile insurance to cover them against theft, damage, and liability; homeowner's or renter's insurance to cover their home and its contents; life insurance to provide for their loved ones if they should die unexpectedly. Your business needs insurance, too.

Businesses customarily hold two types of insurance: liability and property. Sometimes businesses provide health or life insurance coverage for their employees as well, but I won't cover those issues here.

Liability coverage protects you and your business should you be taken to court by someone seeking damages for one reason or another. (I'll discuss liability in more detail later in this chapter.) Liability insurance covers your legal costs in fighting such lawsuits, and it covers damage awards as well. Liability insurance is not always easy to secure, and if you can secure it, it's not usually cheap. Many businesses today limit or forgo liability insurance coverage because of its cost.

Property coverage protects your business against loss of business property, such as the computer equipment you run your BBS on, office furniture, and so on. Should your business property be lost in a burglary or fire, your insurance will cover the loss.

Often liability and property coverage are combined into a single general business insurance policy. Contact a reputable insurance agent in your area for assistance with business coverages. Don't hesitate to shop around for coverage, as prices are likely to fluctuate drastically from company to company. My advice, however, is to beware of small, unknown insurance companies. If you are in any doubt as to the solidity of a particular insurance company, contact your state's insurance division. An insurance policy is only as good as the company behind it.

Before you buy any policy, check what it covers. There are various types of liability, and various types of liability insurance, too. Discuss your needs with your agent to ensure you're getting the best possible coverage for your situation.

Considering Legal Matters

We live in a litigious society, meaning that people often use our democratic form of government to bring legal suits against others they feel have wronged them. We have also tasked our governmental authorities with the responsibility to set and enforce laws for the common good. In any of your day-to-day activities as a member of society, you run the risk of doing something that is a violation of the law. These risks include civil issues (those generally relating to the rights of private individuals, such as copyright violations or breaking a contract) and criminal issues (those generally relating to the common good and safety of the public, such as theft or assault).

When you open and operate a business, you increase your exposure to legal issues arising as a result of your activities or decisions. Although innocent people do occasionally get caught up in legal entanglements, by and large when you attempt to operate your personal and business lives in as fair and honest a way as possible, you can avoid problems. You shouldn't be overly concerned about legal issues.

If you have any concerns or fears about your legal exposure with regard to the operation of your business, as I've suggested many times in this chapter, you should consider seeking the advice of an attorney. Attorneys have experience in these matters and can advise you on them. They can also help you assess ways to minimize any excessive risks you may be running.

Your Potential for Liability

One of the most common types of civil matters you can encounter as a business owner is liability. There are many types of civil

liability: failure to fulfill a contractual obligation, failure to deliver a product or service you promised you would, failure to pay money you owe others, damaging the character or reputation of someone; the list goes on and on.

Most businesses carry liability insurance to protect them against liability lawsuits. This type of insurance, as I discussed earlier, covers the costs involved with fighting the suit in court, as well as for damage awards should you lose your suit. Remember, your insurance will not cover every possible situation; make sure you know your coverage.

The corporate business structure can also help limit your personal exposure to liability, since the corporation itself (and not you personally) is held accountable in most instances. Ask an attorney about the specifics.

Good liability insurance is often expensive and difficult to find. For this reason, you should be prepared to deal with this type of legal entanglement on your own. Again, consult an attorney if you have any concerns about this.

Putting Yourself at Criminal Risk

Another way you and your business can be affected by the law is with criminal issues. Unless you exercise due caution, you can do something criminally illegal in the operation of your business and be held accountable for it. Having a corporate business structure isn't going to help you here. Corporate officers are often held personally accountable when the corporation violates criminal law. Insurance won't help, either; it doesn't cover criminal violations.

Many BBSs have in recent years been the target of criminal actions. The most common type of criminal action is pornography. Adult BBSs are a popular type of system to operate, and many operate with a great deal of financial success. However, some of these systems have been shut down for offering pornographic materials online, which in some jurisdictions is heavily regulated by law, or is just plain illegal. Often, the authorities come knocking on your door, take all of your equipment, and ask questions later.

It is not the purpose of this book to tell you how to run your BBS or what to offer online. My only advice to you is to speak with an attorney if you are concerned about the risk of criminal actions.

Keep in mind that laws vary widely from jurisdiction to jurisdiction. What is perfectly permissible in one city or state may be blatantly illegal and aggressively enforced in another. Don't judge what you do by what others are doing, especially if they're operating in a different area.

Summary

After reading this chapter, you should have an understanding of the following:

- It's important to develop a business mind-set—an attitude about you and your business. There are many facets to this, including managing business and personal time and money separately, thinking big, being realistic, and projecting a professional image.
- Operating costs include not just tangible costs, but more importantly the value of your time.
- You should know how to approach developing a plan for your business, either informally, or formally by writing a traditional business plan. Business plans have many elements, such as goals, financial analysis, and a marketing strategy.
- Business can have three structures: proprietorship, partnership, and corporation. Which one is best for you depends on your particular circumstances. Sole proprietorships are easiest, and corporations are the most involved.
- Your business has obligations, too, such as licensing, tax liabilities, accounting requirements (important for taxes), and insurance.
- Operating a business exposes you to the potential for liability or other legal issues.

Worksheet 10: The Business of Running Your BBS

Check off ways that are appropriate to your circumstances in which you will work to develop a business mind-set. Think of other ways you might approach the development of this mind-set and list them.

- ❑ Realize you are running a business
- ❑ Separate your personal life and your business life
- ❑ Schedule your business time
- ❑ Separate your finances
- ❑ Set realistic goals
- ❑ Think big about your business
- ❑ Be realistic about your business
- ❑ Think outside yourself
- ❑ Project a professional image
- ❑ Other ideas about developing a business mind-set

_____

_____

_____

_____

Do you understand the importance of intangible costs—namely, your personal time—on the success of your business? ❑ Yes ❑ No

Which type of business plan will you prepare for your business?

- ❑ Informal
- ❑ Formal

If you're writing a formal business plan, how much time will you allot for the project?

_____ Hours

Which business structure do you feel is best for your business?

- ❑ Sole proprietorship
- ❑ Partnership
  - ❑ Limited
  - ❑ General
- ❑ Corporation

Research what licenses are required for a business to operate in your area. List the necessary licenses here:

_____

_____

_____

_____

What types of taxes will you have to pay in conjunction with your business?

- ❑ Sales (or use) taxes
- ❑ Income
- ❑ Payroll
- ❑ Other _____

How do you intend to handle business accounting?

- ❑ By hand (ledger sheets, a calculator, and so on)
- ❑ Simple accounting software (such as Quicken)
- ❑ Advanced accounting software (such as Peachtree, M-A-S 90, and so on)
- ❑ Hire an accountant
- ❑ Other

Do you plan to seek insurance coverage for business property? ❑ Yes ❑ No

For liability? ❑ Yes ❑ No

Where do you plan to purchase this insurance? _____

Appendix: Suppliers and Services

BBS Software

eSoft, Inc.
15200 E. Girard Ave., Suite 3000
Aurora, CO 80014
(303) 699–6565 Voice
(303) 699–8222 BBS
(303) 699–6872 Fax

Maker of The Bread Board System, TBBS, a DOS-based integrated BBS, as well as a variety of add-ons for TBBS. The oldest commercial BBS product still available today; over 12 years old. TBBS has been the popular choice in business applications, but many options are available that make it suitable for other types of BBSs as well.

Mustang Software, Inc. (MSI)
P. O. Box 2264
Bakersfield, CA 93303
(805) 395–0223 Voice
(805) 395–0650 BBS
(805) 395–0713 Fax

Maker of Wildcat!, a DOS-based multinode BBS. Wildcat! is a popular choice in multinode BBSs, offering a variety of features including particularly strong sysop maintenance and e-mail gateways. Several different versions of the product are available for different needs. Wildcat! was the first BBS to enter commercial software distribution channels.

MMB Development Corp.
904 Manhattan Ave.
Manhattan Beach, CA 90266
(310) 318–1322 Voice
(310) 318–5302 BBS
(310) 318–2162 Fax

Maker of MMB TEAMate, a UNIX-based BBS. TEAMate offers a variety of strong features, making it probably the most powerful UNIX-based BBS available. TEAMate uses a unique modularized approach to system construction, as well as proprietary graphical end-user interfaces.

Galacticomm, Inc.
4101 S.W. 47th Ave., Suite 101
Ft. Lauderdale, FL 33314
(305) 583–5990 Voice
(305) 583–7808 BBS
(305) 593–7846 Fax

Maker of Major BBS, a DOS-based integrated BBS. Major BBS has always been particularly favored among entertainment-based BBSs, where it remains strong today. Galacticomm is known for adopting technologies early on; it was one of the first to champion RIP as a graphical interface for BBSs.

Clark Development Company, Inc.
3950 S. 700 East, Suite 303
Murray, UT 84107
(801) 261–1686 Voice
(801) 261–8976 BBS
(801) 261–8987 Fax

Maker of PCBoard, a DOS-based multinode BBS. PCBoard has a strong following due primarily to its ease of installation and configuration, as well as its strong file-handling features.

Searchlight Software
P. O. Box 640
Stony Brook, NY 11790
(516) 751–2966 Voice
(516) 689–2566 BBS

Maker of Searchlight, a DOS-based multinode BBS. An inexpensive, full-featured, competitive multinode package. A relative newcomer to the commercial arena.

TeleMedia / Software @ Work
P. O. Box 566491
Atlanta, GA 31156
(404) 395–6525 Voice
(404) 395–6327 BBS
(404) 395–6326 Fax

Maker of TurBoard, a DOS-based multinode BBS unique in that it provides NAPLPS support.

Hamilton Telegraphics, Inc.
P. O. Box 633
Aylmer, Quebec J9H 6L1
Canada
(819) 682–6670 Voice
(819) 682–7771 BBS
(819) 685–0994 Fax

Maker of RoboBOARD, a DOS-based multinode BBS. Originated and supports the Tel-FX graphical interface protocol, an advanced, sophisticated GUI with JPEG support and high-resolution displays.

Digital Dynamics
P. O. Box 501
Yorba Linda, CA 92686
(719) 529–6328 Voice
(719) 529–9525 BBS
(719) 529–9721 Fax

Maker of Synchronet, a DOS-based multinode BBS.

Wantree Development
108 W. 3rd St.
Bonner Springs, KS 66012
(913) 441–1336 Voice
(913) 441–0595 BBS
(913) 441–0442 Fax

Maker of Remote Access, a DOS-based multinode BBS.

Coconut Computing, Inc.
7946 Ivanhoe Ave., Suite 303
La Jolla, CA 92037
(619) 456–2002 Voice
(619) 456–0815 BBS
(619) 456–1905 Fax

Maker of Coconet, a UNIX-based graphical BBS. Coconet was one of the first BBSs to provide a graphical interface to callers. Its graphical capabilities remain the most popular feature of this system.

Z/MAX Computer Solutions, Inc.
8287 Loop Road
Baldwinsville, NY 13027
(315) 635–1882 Voice
(315) 635–1908 Fax

Maker of XChange, a UNIX-based BBS package.

INFO*SHARE, Inc.
P. O. Box 1501
Woodbridge, VA 22193
(703) 791–2910 Voice
(703) 803–8000 BBS

Maker of Falken, a DOS-based integrated BBS.

SoftArc, Inc.
805 Middlefield Road, Suite 102
Scarborough, Ontario M1V 2T9
Canada
(416) 299–4723 Voice
(416) 754–1856 Fax

Maker of FirstClass, a Macintosh-based BBS.

ResNova Software
5011 Argosy Drive, #13
Huntington Beach, CA 92649
(714) 379–9000 Voice
(714) 379–9004 BBS
(714) 379–9014 Fax

Maker of NovaLink, a Macintosh-based BBS.

Spider Island Software
4790 Irvine Blvd., Suite 105–347
Irvine, CA 92720
(714) 669–9260 Voice
(714) 730–5785 BBS
(714) 669–1383 Fax

Maker of TeleFinder, a Macintosh-based BBS.

The Freesoft Company
105 McKinley Rd.
Beaver Falls, PA 15010
(412) 846–2700 Voice

Maker of Second Sight, a Macintosh-based BBS.

Online Graphical Technologies

TeleGrafix Communications, Inc.
16458 Bolsa Chica, #15
Huntington Beach, CA 92649
(714) 379–2131 Voice
(714) 379–2133 BBS
(714) 379–2132 Fax

Maker of RIP, the Remote Imaging Protocol, an online graphical interface for BBSs. Supplier of RIPaint, a RIP screen-generation tool; RIPterm, a RIP terminal program; and other RIP products.

Imagen, Inc.
504–1168 Hamilton St.
Vancouver, BC V6B 2S2
Canada
(604) 687–7511 Voice
(604) 687–1030 BBS

Maker of Fracterm, a fractal compression system to rapidly display compact high-resolution images online.

Durand Communications Network
5276 Hollister Ave., Suite 405
Santa Barbara, CA 93111
(805) 964–4899 Voice
(805) 964–2833 BBS
(805) 683–7690 Fax

Maker of DC Net, a database and online image-display system.

Credit-Card Merchant Accounts

Most credit-card merchant accounts are provided by local banks. The following is a popular alternative to your local bank.

Teleflora CreditLine
12233 W. Olympic Blvd.
Los Angeles, CA 90064
(800) 325–4849

Major Vendors of Internet Services

The following are the larger providers of Internet access services, such as UUCP accounts for Internet e-mail.

Information Access Technologies, Inc., (Holonet)
46 Shattuck Square, Suite 11
Berkeley, CA 94704
(510) 704–0160 Voice
(510) 704–1058 BBS
(510) 704–8019 Fax
E-Mail: info@holonet.net

Colorado SuperNet
Colorado School of Mines
1500 Illinois St.
Golden, CO 80401
(303) 273–3471 Voice
(303) 273–3475 Fax
E-Mail: info@csn.org

NETCOM
4000 Moorpark Ave., Suite 209
San Jose, CA 95117
(408) 554–8649 Voice
(408) 241–9145 Fax
E-Mail: info@netcom.com

UUNET Technologies
3110 Fairview Park Drive
Falls Church, VA 22042
(800) 488–6384 Voice
(703) 204–8001 Fax
E-Mail: info@uunet.uu.net

NovaLink
79 Boston Turnpike, Suite 409
Shrewsbury, MA 01545
(800) 274–2814 Voice
E-Mail: info@novalink.com

The Well
27 Gate 5 Road
Sausalito, CA 94965
(415) 332–4335 Voice
(415) 332–1669 Fax
E-Mail: info@well.sf.ca.us

X.25 Networks

The following are the four largest providers of X.25 access for BBSs.

BT North America (formerly Tymnet)
2560 N. 1st St.
San Jose, CA 95131
(800) 872–7654 Voice

Sprintnet (formerly Telenet)
8320 Ward Parkway
Kansas City, MO 64114
(800) 736–1130 Voice

CompuServe, Inc.
5000 Arlington Centre Blvd.
Columbus, OH 43220
(614) 457–8600 Voice

Automated Data Processing
Autonet Division
175 Jackson Plaza
Ann Arbor, MI 48106
(313) 995–6501 Voice
(313) 995–6458 Fax

Long-Distance Carriers

The following are toll-free numbers for the three major U. S. long-distance carriers. These numbers will put you in touch with customer service for business sales.

AT&T
(800) 222–0400

MCI
(800) 444–2222

Sprint
(800) 877–4646

Modem Manufacturers

The following are major modem manufacturers who, at press time, offer BBS sysop discount purchase programs. Contact individual vendors for pricing and availability.

Hayes Microcomputer Products, Inc.
(404) 840–9200 Voice
(404) 446–6336 BBS

Intel PCEO
(503) 629–7000 Voice
(503) 645–6275 BBS

AT&T Paradyne
(813) 530–2000 Voice
(813) 532–5254 BBS

ZyXEL
(714) 693–0804 Voice
(714) 693–0762 BBS

Practical Peripherals, Inc.
(805) 497–4774 Voice
(805) 496–4445 BBS

Supra Corp.
(503) 967–2400 Voice
(503) 967–2444 BBS

Telebit Corp.
(408) 734–4333 Voice
(408) 745–3861 BBS

USRobotics, Inc.
(708) 982–5010 Voice
(708) 982–5092 BBS

Digicom Systems, Inc.
(408) 262–1277 Voice
(408) 262–1412 BBS

GVC Technologies
(201) 579–3630 Voice
(201) 579–2380 BBS

Glossary

386Max A popular memory manager for PCs and compatibles.

API Applications Programming Interface. A mechanism used by many software programs that allows developers to write modules or program extensions according to a specification that can then be added to the main program, thereby extending its capabilities.

asynchronous server A device or method of sharing serial connections in a LAN environment; allows workstations to access shared serial ports.

baud A technically inaccurate term used to describe serial data rates; see *bps*.

bitmap In computer graphics, an image stored and displayed as a series of pixels, much like a photograph in a newspaper. Used primarily for photographic images. Also known as *raster* images.

bits per second See *bps*.

bps Abbreviation for *bits per second*. A measurement of serial data rates (as used in modems). See also *baud*.

bridge In LAN environments, a device that connects two or more smaller network segments.

bus An expansion mechanism for microcomputers whereby additional hardware devices can be installed within the computer to add capabilities or functions.

captive linked door A software program that users can run online, and that was engineered specifically for the BBS software on which it runs. The program cannot be executed on any other BBS software. See also *door* and *gateway door*.

chat See *teleconferencing*.

chat linking A mechanism by which the chat facilities of one BBS can be connected to the chat facilities of another BBS, thereby allowing users on both systems to chat with one another in real time through the link.

client In LAN environments, a synonym for *workstation*. In some BBS packages, a remote user's terminal program.

color palette In computer graphics, the array of colors that can be displayed using a particular display technology.

concentrator In Ethernet LAN environments, a device that concentrates or centralizes the connections of individual machines at the server.

data compression In modem communications, a technique whereby the data passing from one modem to another is compressed for faster effective throughput from point to point. In file archiving, a technique whereby files stored within an archive are compressed to take up less disk space.

DCE Abbreviation for *data communications equipment*. With BBSs, normally refers to a modem. Opposite of *DTE*.

DESQview A popular multitasker for DOS applications.

dial-up modem A modem designed for conventional voice telephone lines (as opposed to one designed for use on advanced leased lines).

disk cache A software program that buffers disk accesses for increased speed. Also can be hardware-based in a disk controller.

domain address In Internet, the style of addressing used to send e-mail from one Internet user to another; for example, jdoe@foobar.com.

domain name In Internet, the portion of the e-mail address to the right of the at sign. For example, in jdoe@foobar.com, *jdoe* is a user name and *foobar.com* is the domain name.

door A mechanism by which users of the BBS can shell to the operating system and execute a program external to the BBS software. See also *gateway door* and *captive linked door*.

door application A program designed to run via a door. See also *door*.

DOS Abbreviation for *disk operating system*. Although applicable in a variety of areas, generically used to describe MS-DOS or PC-DOS, an operating system for the PC platform.

download The act of electronically transferring a file from a remote computer system to your computer system. Normally applied in BBS environments from the user's point of view: a file sent from the BBS to the user.

DR-DOS A PC operating system compatible with MS-DOS, released by Digital Research.

DTE Abbreviation for *data terminal equipment*. With BBSs, normally refers to a computer and its serial port. Opposite of *DCE*.

electronic mail See *e-mail*.

e-mail Abbreviation for *electronic mail*. Messages in electronic form that are sent by one person to another person.

e-mail gateway A mechanism or device to pass electronic mail between two disparate e-mail systems.

e-mail networking The act of connecting your BBS to an electronic mail network for the purposes of sharing messages with other systems.

e-mail systems Computer services that exclusively provide wide-area electronic mail services.

EMS Expanded Memory Specification. A type of paged memory in a PC.

error correction In modem communications, a technique whereby data transfer errors within the data connection itself (between two modems) are automatically and transparently corrected.

Ethernet An electronic networking transport mechanism that forms the electrical connection core of most local area networks.

expanded memory See *EMS*.

extended memory See *XMS.*

FidoNet A worldwide amateur electronic mail network connecting BBSs.

file attachment See *file enclosure.*

file enclosure A computer file that is associated with an electronic message on a BBS so that the reader can download the associated file.

file libraries A collection of files on a BBS that are offered for download to users.

file transfer The electronic sending or receiving of computer data or program files.

FOSSIL Fido/Opus/SEAdog Standard Interface Layer. A widely accepted serial-port device driver used in PCs and compatibles. Originated with FidoNet mailer programs.

freeware Computer software for which the author retains copyright, but that is allowed to be copied freely without obligation to the author.

ftp File-transfer protocol. A method of copying files from one computer system to another via the Internet.

gateway Generically, any mechanism by which two disparate technologies are linked and are made able to communicate.

gateway door A mechanism by which users of the BBS can connect to another line on the system and be connected to a computer separate from the BBS in order to run a program online. See also *door* and *captive linked door.*

GIF Abbreviation for *Graphics Interchange Format.* A bitmapped computer-image file format developed by CompuServe Information Service and used widely among BBSs to store computer pictures.

graphical user interface See *GUI.*

GUI Abbreviation for *Graphical User Interface. A* method of allowing a user to interact with a computer system having graphical screen elements and designs.

host mode An operating mode of a modem communications software package that accepts incoming modem calls and provides basic BBS-like functionality.

hunt group A mechanism by which telephone calls circulate among a group of telephone numbers automatically; when one number is busy, it rings the next, then the next, and so on.

information display The transmission of information to the caller of a BBS for the purpose of reading online, such as bulletins, news, technical notes, and so on.

information gathering The collection and storage of information by the BBS from callers to the system, including surveys, questionnaires, polling, and so on.

interface data rate The speed at which a modem is interfaced to a serial port, measured in bits per second.

Internet A global metanetwork of government, educational, and corporate computer sites best known for providing e-mail services.

ISDN A type of dial-up telephone connection that is digital rather than analog (as conventional telephone lines are).

JPEG Joint Photographic Experts Group. A highly compact file format for storing bitmapped computer images.

LAN Abbreviation for *local area network*. A system that physically connects multiple computers, and allows connected computers to share information, data files, programs, output devices (like printers), and send electronic mail.

LAN adapter A card that installs within a computer and allows it to be electrically connected to a local area network.

LAN e-mail gateway A method or device to pass mail between a BBS and the electronic mail system of a local area network.

leased line A type of telephone connection normally used to connect a computer at one location to a computer at another location. The connection is not dial-up; it remains connected at all times.

local area network See *LAN.*

Macintosh (also *Mac*) A popular graphically oriented computer manufactured by Apple Computer Corporation.

memory manager For PCs, a software program that oversees the use and distribution of system memory.

message facilities The provisions on a BBS that allow users to communicate electronically with one another. See also *e-mail* and *public message conferences.*

Message Handling Service The e-mail messaging facilities integral to a Novell NetWare LAN. Abbreviated as *MHS.*

metanetwork A collection of e-mail networks that operate as a single cooperative entity.

MHS See *Message Handling Service.*

modem Derived from *modulator/demodulator.* A device that connects a computer to a telephone line through a serial data connection.

modem data rate The speed at which one modem communicates with another, measured in bits per second.

MS-DOS The most popular and established operating system for the PC platform.

multitasker A software program that can manage the simultaneous execution of several different computer programs.

nanny machine See *slave machine.*

NAPLPS Abbreviation for *North American Presentation Level Protocol Syntax.* An online graphical display mechanism developed in the 1980s for use on teletext systems.

network coordinator In FidoNet, the person who heads a local net, usually all of the systems within a city.

network operating system The software that drives a local area network and provides various LAN services. Abbreviated as *NOS.*

networked mail E-mail messages that are sent from one BBS to another BBS or online message system.

newsgroups Also called *Usenet newsgroups*. In Internet, networked public message areas, each on a particular topic.

nodelist In FidoNet, the address book or list of systems in the network.

NOS See *network operating system.*

Novell NetWare A local area network (LAN) operating system software package; probably the most popular LAN operating system currently in use.

null-modem adapter A device that allows a DTE serial device to be connected to another DTE serial device. With BBSs, usually it connects one computer's serial port to a serial port on the BBS.

off-line mail reader A method or system whereby users can download all new messages on a BBS, read the messages off-line (while not connected to the BBS), and later upload replies back to the BBS.

OS/2 A graphical multitasking operating system for the PC platform.

packet assembler disassembler A piece of equipment used to connect a BBS to an X.25 network. It converts a single high-speed, multiplexed data connection into individual BBS connections. Abbreviated as *PAD*.

packet-switched data network A data communications network used to connect computer systems in lieu of a telephone line, and to allow local access to a central computer from locations worldwide. Also called *X.25 network*.

PAD See *packet assembler disassembler.*

PC Abbreviation for *personal computer*. Although used generically in many cases, it is most frequently used to designate computers compatible with the IBM PC architecture. Also *PC compatible* when used to describe IBM PC compatibility.

PC-DOS A PC operating system compatible with MS-DOS, released by IBM.

peer-to-peer LAN A LAN that does not have a dedicated server; any computer on the LAN can be configured as a workstation and/or a server.

pixel A single dot on a computer display. Hundreds or thousands of pixels combine in varying colors and intensities to form an image on a computer screen.

primitive An individual drawing element in a vector computer image.

public-domain software Computer software to which the author does not retain copyright. True public-domain software can be used, changed, sold, copied, distributed, or in any other way exploited without obligation to the author of the software.

public message conference A separate section of a BBS on a set topic of discussion where messages are sent by one person and can be read by any number of other people. Also called *message boards* or *message areas*.

QEMM A popular memory manager for the PC.

QWK Named for the files used by the QuickMail off-line mail reader system, QWK is a de facto industry-standard off-line mail-reader file format.

raster See *bitmap*.

regional coordinator In FidoNet, the person who heads a region of the network, usually a multistate geographical area.

remote hosting A method of remotely accessing all of a computer's functions, including full input (keyboard, mouse, and so on) and output (text and graphics displays, printers, and so on).

remote LAN access A method provided for users of a local area network (LAN) to access functions of the network from a remote location.

repeater In LAN environments, a device that boosts the signals on lengthy network connections.

RIP Abbreviation for *Remote Imaging Protocol*. An online graphical interface designed for use with BBSs.

RIPscrip A computer image that is formed using the RIP protocol.

server Refers to a host or central processing system. In LAN environments, a machine whose resources (hard disk, printers, and so on) are available to workstations on the LAN. With some BBS packages, the machine running the BBS.

shareware Computer software that the author allows to be freely copied. If a user of the software finds it to be of value, he or she pays a fee to the author to register the software and become a legitimate, long-term user.

short-haul modem A device used to boost the signal on a lengthy serial data connection.

slave machine Usually used in conjunction with integrated BBS systems, a machine connected to the BBS that is used for secondary processing such as CD-ROM download handling, fax delivery, and so on. Also called *nanny machine*.

SLIP A version of the TCP/IP protocol designed for use with switched connections (conventional dial-up modems). Stands for *serial line Internet protocol*.

store-and-forward e-mail Networked electronic mail that is entered and stored on the BBS and forwarded to its destination at a later scheduled time.

sysop Abbreviated version of *system operator*. The owner and/or operator of a bulletin board system.

TCP/IP Abbreviation for *Transmission Control Protocol/Internet Protocol*. A networking protocol used in UNIX environments and within the Internet for continuous real-time communication and resource sharing.

teleconferencing A BBS function that allows a user to type in real-time to other users connected to the BBS. Also called *chat*.

teletext (also *videotex* or *videotext*) Generally, any electronic online service which is not interactive; that is, information flows and is captured, displayed, or processed without input on the part of an individual. Historically used for news services, stock

trading, and so on, often employing cable television or TV and radio broadcast subcarriers for transmission (as opposed to telephone lines).

Tel-FX A graphical online interface developed for use with BBSs.

telnet A method of logging into one computer system from another via the Internet.

terminal server In a BBS setting, a device that is often used to convert serial connections to a single high-speed multiplexed data line, generally for real-time Internet connections.

text searching The operation of searching for a word or phrase online, usually within a single text file or a collection of files.

theme The subject matter or focus of your BBS.

transaction processing Any process where a person inputs information, and a computer system processes this information and returns a result that varies based on the information entered. Examples include airline reservations systems, bank transaction systems, and ordering systems.

uninterruptible power supply See *UPS.*

UNIX A popular multitasking operating system originated by AT&T Bell Labs.

upload The act of electronically transferring a file to a remote computer system from your computer system. Normally applied in BBS environments from the user's point of view: a file sent to the BBS from the user.

UPS Abbreviation for *uninterruptible power supply.* A device that compensates for minor fluctuations in electrical power and short-duration power outages.

Usenet One of the networks that makes up the Internet; origin of newsgroups.

UUCP Abbreviation for *UNIX to UNIX Copy Program.* A mechanism whereby electronic mail can be passed from one system to another. Used primarily in the Internet.

vector In computer graphics, a way of storing and representing a picture as a series of lines, dots, or patterns; that is, instructions on how an image should be reproduced (rather than the image itself, as with a bitmap).

WAN Abbreviation for *wide area network*. A computer network which connects computer system resources over a wide geographical area, often across the country or internationally.

wide area network See *WAN*.

Windows A graphical multitasking operating environment for the PC platform.

workstation In LAN environments, a PC connected to a network that is not a server. See also *server*.

X.25 network See *packet-switched data network*

XMS Extended Memory Specification. A type of memory in a PC.

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The version of TBBS included with this book is provided as a single self-extracting archive file on the enclosed 3.5" low-density 720k diskette.

The software as supplied is pre-configured and MUST BE INSTALLED ON A HARD DISK ON THE C: DRIVE. You must have approximately 1.5 Megabytes of hard disk space available on the C: drive before attempting to install.

Once you are ready for installation, follow these steps:

1. On the C: drive, from the root directory, make a directory named TBBS. To do this, from the DOS prompt, type:

   MD TBBS

   IMPORTANT: Issue this command from the root directory on the C: drive. The software is pre-configured to run in the C:\TBBS directory ONLY.

2. Change to the newly created directory. To do this, from the DOS prompt, type:

   CD \TBBS

3. Insert the diskette in drive A: or drive B: (depending on which drive is equipped with a 3.5" disk drive). From the C:\TBBS directory, and if the disk is in the A: drive, type:

   A:TBBS22_2 -d

   If the disk is in the B: drive, type:

   B:TBBS22_2 -d

4. Several directories will be created, and the software will be installed into the proper directories automatically.

5. When file copying is complete, the DOS prompt will reappear. At this point, you may wish to use a file viewer or text editor to view the file TBBS.DOC, which you will find in the new C:\TBBS directory. This file contains the documentation for the version of TBBS included with this book. If you wish to print the documentation, you may do so from your text editor or word processor. If you prefer, you can issue the following command from DOS to print the file:

   COPY TBBS.DOC PRN

   This will print the documentation on the printer attached to the first parallel (printer) port on your PC.

   CAUTION: The documentation file is very large, and will take several dozen pages to print out. Make sure your printer has plenty of paper loaded before printing.

   IMPORTANT: The TBBS.DOC file contains the complete text of the software license agreement. By using this software, you are indicating your acceptance of the terms of the license. You may wish to read the license in its entirety before proceeding.

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Alan D. Bryant is Director of Marketing for eSoft, Inc., and is a contributor to *Boardwatch Magazine*. He is the owner of Bryant Software and is a software developer for BBS add-on utilities and entertainment products.

System requirements for TBBS software: IBM-compatible PC, monitor, 512K available base RAM, 1.5MB available disk space, standard serial port (COM1 or COM2), Hayes compatible external modem or internal modem configured to COM1 or COM2.

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